Volume 93 Number 9

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

IRON and steel this week begins its great adventure into the realm of price control—a realm it has not explored since the billet, bar iron, wire and other pools of the 90's, the wartime experience being more in the nature of price fixing than control. For all but a handful of older executives, selling is in process of being revolutionized by the code of fair competition (p. 17) authorized by NIRA. Prices will tend toward uniformity and a more rational and remunerative basis, concessions will vanish before the threat of a $10 per ton penalty, service and quality and personal relations will be reinstated as dominant influences. Such is "the new deal" for steel!

Price Schedules Effective This Week

The iron and steel code being effective Aug. 19, when signed by the President, Tuesday the 29th is the deadline for filing prices for the remainder of this quarter (p. 11). Conferences at New York and Pittsburgh last week were preliminary to these schedules. . . . Sober second thought in Washington is that steel, in winning approval of its wages, hours and price-control machinery (p. 43), achieved its objectives. . . . Washington also is becoming conscious (p. 13) of a more conservative trend in NRA despite a more vigorous offensive by organized labor. . . . The inflow of codes for various branches of the iron and steel industry continues (p. 11), the warehouse and concrete bar proposals being filed.

Output Eases, but Positive Factors Gathering

Though uncertainties in the iron and steel markets bred by the new codes are lifting, current consumption is still declining, this being partly seasonal (p. 51). In September, receding demand is expected to encounter rising prices and be reversed. . . . Steelmaking operations last week (p. 12), at 48 per cent, represented another 3-point drop. . . . Lighter specifications from automotive buyers, nearing the end of their runs on 1933 models, are partly responsible (p. 15). Coiled springs may be featured on some 1934 cars. . . . While exports of iron and steel eased sharply in July, due to a falling off in scrap, outward shipments of finished steel increased (p. 14); imports gained notably. . . . Overseas markets are quiet (p. 67), but hopes for a fall pickup are bright.

Steel, Welding Give New Life to Diesels

High weight ratio, ranging from 40 to 250 pounds per horsepower, has restricted the use of diesel engines in the marine and transportation fields; but engine structures of rolled steel, plates and shapes, assembled by welding, have come to the rescue (p. 31), reducing the weight

Sales promotion manager has a hobby; hence M. S. Curtis, who holds this position with Youngstown Sheet & Tube Co., makes models of equipment in which his company is interested. The cable tool drilling rig is exactly to scale in all parts; exhibited recently at Atlantic City

ratio to less than 10 pounds per horsepower, thus pointing to new possibilities for oil engines as motive power. . . . Welding as a maintenance tool saved $300 for an oil refinery operator. A cast-iron centrifugal pump head had cracked badly (p. 47) and to replace it required either a new pump or repair of the old head. The latter was done, the head being bronze welded at an overall cost of about $50.

Proving Its Worth on Land and Sea

To prove the universality of steel by listing its applications would require many volumes, but convincing testimony is furnished by the cumulative total of regularly reported new or unrecognized uses. Currently, four random selections will suffice: 100 signposts at the Chicago exposition (p. 40) required nearly 10 tons, mostly pipe; sliding fire escapes, constructed of alloy steel sheets and particularly adapted to exterior installation on schools and hospitals, account (p. 41) for an important tonnage yearly; hollow steel floats for trawler fishing nets are a new product (p. 47) of an English manufacturer; and a 35 per cent cobalt steel has been found to have improved properties for use in permanent magnets.

Check Theory Against Practice in Rolling

Behind the successful development of all new steels, however, are years of progress in the perfection of rolling technique. Much investigation has been carried out seeking to calculate actual rolling pressures in hot rolling mills. Formulas have been established (STEEL, Aug. 21, p. 27) and later checked (p. 44) from a practical standpoint. The latter procedure called for the rolling of rectangular bars which had been previously prepared by covering each side with a net work of equally-spaced, intersecting, shallow, V-shaped grooves. When the bars had been rolled halfway through, the mill was reversed and the portions which had been in the region of compression were preserved for examination.

Steel Houses Show Promising Future

A comprehensive survey made by a leading steel company discloses (p. 36) that major differences between the use of steel frames in tier buildings and residences favor the residence field. Data are presented to substantiate this claim and for the first time is made available a tentative basis upon which the bending or compression stresses of sheet steel may be computed. . . . Monel metal is accorded the distinction of being the first nonferrous metal to be used to transmit an engine force of 3170 horsepower, the metal being used for propeller shafts (p. 38) in Gar Wood's racer, MISS AMERICA X.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

What Is Meant by "Open Shop"?

To the Editor:

Perhaps this is a good time to reach a national understanding as to what is meant by the term "open shop."

Many years ago the Worcester branch of the National Metal Trades association drew up the following definition, and I know of none better:

> "An open shop is an industrial establishment in which there is no discrimination practiced or advocated by either the management or the employes which would restrict the opportunity of loyal citizens to work therein."

General Johnson's definition I understand to be as follows:

> "An open shop is a place where any man who is competent and whose services are desired will be employed regardless of whether or not he belongs to a union."

It is unfortunate that the two definitions given above do not mean the same thing.

So long as all unions take the attitude that a nonunion worker is a "scab," the acceptance of the last definition would deprive management of industry of its right and of its obligation to protect the nonunion workers from continual annoyance of forced membership in a national union.

It goes without saying that industries chartered by the state to make goods for public use should not limit employment to one class of citizens. As a matter of fact there is no such discrimination practiced as a rule, except against members of trade unions who themselves believe in and advocate the principal of the closed shop.

To all of us who are interested in seeing the President make a success of his great industrial experiment I am sure it would be a great relief to have General Johnson give us some assurance that his definition of the open shop means the same as the Worcester definition.

JEROME R. GEORGE

Marion, Mass.

The Steel Industry and the Public

To the Editor:

The editorial, entitled "The Public—Shall It Be Friend or Foe of Steel?" will be received with favor by everyone who has at heart the interests of the iron and steel industry.

Probably no one company or individual is responsible for the present condition, but it is a fact that the steel industry has become a target for sensational newspapers, demagogic politicians and a certain type of academic economists. Naturally public opinion has yielded somewhat to the constant rain of invective from these sources.

The job of the steel industry is to reverse the trend of this opinion. It is an educational job. Explain to the people what the industry has done and is doing for the public interest and much of the present suspicion and hate in time will be changed to confidence and good will.

STEEL CONSUMER

Ohio.

File Coded Iron, Steel Prices With Institute; Few Changes

NEW YORK

CONFERENCES here last Wednesday, Thursday and Friday were preliminary to the filing of price schedules on all iron and steel products as required by the code of fair competition of the iron and steel industry approved by President Roosevelt at Washington, Aug. 19, and effective on that date.

Ten days being allotted for the submission of prices to the American Iron and Steel institute, Tuesday the 29th is the deadline. These prices are effective immediately, for the balance of the third quarter.

There being a stipulation that contracts must be shipped out within four months, fourth quarter prices cannot be filed before Sept. 1, these prices to become effective ten days after filing.

The first meeting of the institute board, which under the trade code will govern the price control machinery, will be held shortly, possibly Monday the 28th. At this meeting the three government representatives, including Gen. Hugh S. Johnson, administrator of NRA, are expected to be present.

Present Levels to Hold

In view of the fact that consumers have already covered most of their commitments for the third quarter and prices which must be filed by Tuesday can apply only to the remainder of this quarter, few deviations from present quoted levels are probable. A $1 rise in eastern pig iron, filed Friday, was the first development under price control sections of the code.

Some of the larger products having been advanced $3 to $5 a ton during the past 60 days, no adjustments in these products are expected for the fourth quarter. A determination of the new Chicago base price, possibly $1 a ton over Pittsburgh instead of $2, seems probable.

Under the trade code, which is printed in full in this issue beginning with page 17, all producers must file their prices on all products with the institute, and any deviations are punishable by a fine of $10 per ton. As before stated, specific permission must be received to make a contract running beyond one calendar quarter.

Basing points for five additional product classifications are listed in the revised code. In addition, there are several minor changes in the published basing points of the original text. Railroad angle bars are dropped, as a separate classification.

The added products are rolled or forged axles, with Pittsburgh, Chicago and Birmingham the basing points; alloy ingots, blooms, billets and slabs, with basing points at Pittsburgh, Buffalo, Chicago, Canton, O., Massillon, O., and Bethlehem, Pa.; low phosphorus pig iron, Birdsboro, Pa., Steelton, Pa., Standish, N. Y,. and Johnson City, Tenn.. boiler tubes, Pittsburgh; and rolled steel car wheels, Pittsburgh and Chicago.

Under bale ties, there is an amplifying provision to the effect that the San Pedro, Calif., basing point includes Wilmington and the San Francisco base includes Oakland. The wording under standard Tee rails has been changed to read "rails of more than 60 pounds per yard, angle bars and rail joints" instead of "rails of 60 pounds per yard and heavier."

Jackson, O., is included in the pig iron basing points, and Minnequa, Colo., is substituted for Pueblo in the railroad tie plate and railroad track spike classifications. Waukegan, Ill., replaces Chicago as one of the basing points for telephone wire. Pacific coast ports are eliminated as basing points for this product.

Text of Code Is Available In Booklet Form

THE complete text of the steel code, as approved Aug. 19 by executive order of President Roosevelt, is presented in this issue, beginning on page 17. It is carefully annotated to show revisions from the original text submitted to NRA on July 14.

Separate copies of the approved code, printed in larger type, bound in handy booklet form and including a classified table of basing points and the text of the national industrial recovery act, can be supplied for 25 cents per copy, cash with order.

Write to STEEL, 1213 West Third street, Cleveland.

Specifically, the code is in effect for a trial period of 90 days, or until Nov. 16. As soon after Nov. 1 as the industry operates at 60 per cent, an 8-hour day is provided; so far as is known, the American Rolling Mill Co. is the only large integrated producer now entirely on this basis, for all practical purposes.

While the iron and steel code, which is the base for that and all allied industries, is disposed of, codes of subsidiary industries are flowing in.

The American Steel Warehouse association has received approval of the labor provisions of its code, which provides a minimum work week of 40 hours for plant employes and hourly minimums ranging from 35 to 37½ cents per hour.

Labor provisions of the code of Institute of Scrap Iron and Steel Inc. also have been approved. these providing for a maximum office and industrial workers week of 40 hours and minimum wage rates of 37½ cents per hour, except in the Birmingham district where 27 cents applies and in the so-called southern district where 25 cents is the rate.

Following a conference with Deputy Administrator King of NRA, the Fabricated Metal Products Federation has addressed 6500 manufacturers and trade associations employing from 750,000 to 1,500,000 persons in the fabricated metal products industry urging agreement upon a single basis code. H. D. North, president of the Ferry Cap & Set Screw Co., Cleveland, is chairman of the federation.

Seeks Import Limitation

A limitation on imports of foreign manganese ore and alloys has been asked by the American Manganese Producers association in a petition to the President filed with General Johnson under provisions of NRA for a consideration immediately following the effective date of the code for that industry.

Reinforcing concrete bar industry, meeting at Washington Friday approved a code which was drawn up by the code committee of institute following conferences with NRA officials. W. H. Pouch, president; Richard Johnson, secretary, and members of the code committee have been in Washington several days working on the code. It will be filed immediately with NRA.

The code committee of structural steel fabricators was meeting in New York late last week, and it was expected that the code would be ready for filing in Washington Monday.

The Malleable Founders' society, acting on behalf of the entire malleable foundry industry, has received authorization to substitute for para-

graph 3 of the President's Re-employment agreement the following:

"Factory or mechanical workers or artisans shall not be employed more than 40 hours per week, nor more than 10 hours per day."

With reference to minimum wages as set forth in the President's agreement, malleable founders are privileged to substitute from the malleable foundry code the following:

"Factory or mechanical workers or artisans shall receive not less than 40 cents per hour unless the hourly rate for the same class of work on July 15, 1929, was less than 40 cents per hour, in which latter case not to pay less than the hourly rate on July 15, 1929, and in no event less than 30 cents per hour; provided, however, such employees shall receive not less than 25 cents per hour in the southern area of the United States which is defined as the states of Virginia, Kentucky, Tennessee, Mississippi, North Carolina, South Carolina, Georgia, Alabama and Florida. It is agreed that this paragraph establishes guaranteed minimum rates of pay regardless of whether employee is compensated on basis of time rate or piece work performance."

Sheet Sales Down in July; Output, Shipments, Gain

Sheet sales in July averaged 5619 net tons, compared with 8225 tons in June, as reported by the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Production averaged 6069 tons daily, up from 5542 tons in June; and shipments, 5617 tons, against 5098 tons in June. Sales for July totaled 174,191 tons; production, 188,143 tons; and shipments, 174,145 tons.

Unfilled tonnage Aug. 1 was 228,696 tons. Total sheet capacity in the United States for July was approximately 550,000 net tons; and the capacity on which the association's figures are based was 325,000 tons.

Canada's July Steel, Iron Output Best in Two Years

July production of pig iron in Canada totaled 31,689 tons, the highest monthly output for two years, according to the report of the Dominion bureau of statistics. Production was composed of 24,156 tons of basic, 4222 tons of foundry and 3311 tons of malleable iron. The three furnaces active July 31 had a daily capacity of 1175 long tons, approximately 28 per cent of the total capacity of blast furnaces in Canada. For the first six months of the current year, 36,210 tons of pig iron was produced.

Steel ingots and castings produced in Canada during July amounted to 49,076 tons, the highest since August, 1931, and a sharp advance over the June figure of 31,602 tons. Output for the first seven months of 1933 totaled 179,540 tons, compared with 207,994 tons for the same period last year. Production of ferroalloys for the month at 1266 tons showed an increase of 36 per cent over the June total of 932. The seven months' total of 7366 tons compares with 9651 tons for the first seven months of 1932.

Steel Rate Eases 3 Points to 48%

STEELWORKS operations in the week ended Aug. 26 were pulled down 3 points to 48 per cent, lowest level since the second week of June, due to declines from 1½ to 8 points in the eastern Pennsylvania, Pittsburgh, Cleveland, Youngstown, Lorain and Buffalo districts.

A stationary condition was reported by works in the Wheeling, Birmingham, Chicago and Detroit districts. New England, up 2 points, was the only district to improve.

A scheduled 2-point decline at Pittsburgh this week and uncertainties in some other districts appear to insure a decrease this week. Details for various districts follow:

Cleveland

Steel ingot production for the week ended Aug. 26 averaged 72 per cent, down 5 points from the preceding week. Corrigan, McKinney Steel Co., Aug. 23 reduced the number of its active open hearths from 12 to 10; National Tube Co., Lorain, was down from 12 to 11, while Otis Steel Co. continued with six. Interlake Iron Corp. relighted the second of its two blast furnaces at Toledo, O., last week.

Pittsburgh

Rate of production of steel in this district slipped off 3 points last week to approximately 43 per cent as an average for all producers. Open-hearth operations in a leading independent's plant continue at just above 50 per cent, although another leading interest is running at barely 40. The smaller independents here, whose capacity is no more than 10 to 12 open hearths, seems to average on a 40 per cent rate. For this week, it is likely a further decline in operations may be recorded and the average may dip to 41 per cent. Blast furnace operations underwent a decline here last week after six steady weeks of activity at the highest rate in two years. Carnegie Steel Co. banked five furnaces in the Pittsburgh district, two Carrie and three Duquesne. Blast on one of the Duquesne furnaces was subsequently resumed late in the week—therefore, making net loss confined to four stacks.

There are now 19 out of 53 steelworks blast furnaces operating here. Eleven of these are United States Steel Corp., six are Jones & Laughlin and one each Pittsburgh Crucible Steel and Pittsburgh Steel stacks.

Wheeling

Steel ingot output in this district bore up unchanged through last week at 80 per cent, with 27 out of 37 open hearths in the district on the active list. The rate for this week probably will hold at 80.

Chicago

Ingot production was steady the past week at 48 per cent, with only a small decrease in prospect for the immediate future. Production by several mills this month will approximate that of July but with backlogs declining some recession is anticipated for September. Blast furnace schedules are unchanged at 11 active steelworks stacks out of 36.

Buffalo

Operations in the Buffalo district continue at 41 per cent this week after a 17 point plunge from mid-August production. Producers decline to comment on the sharp drop, but say there is hope for an increase shortly after Labor day. Fifteen open hearths are now making steel.

Youngstown

Steel output here last week dipped 7 points to an average of 53 per cent, and district mills are expected to start this week at that level. Forty-four out of 83 open-hearth furnaces are operating.

Eastern Pennsylvania

A decline of 1½ points has dropped the operating rate for this district to 39 per cent.

New England

Steelmaking operations for the week ended Aug. 26 were at 85 per cent. Operations last week did not come up to expectations, although for a short period output was close to 90 per cent. Two steelworks are expected to operate at capacity.

Birmingham

Steelmaking operations continue unchanged at 55 per cent, but with indications pointing to a decline as new business is less active.

WINDOWS OF WASHINGTON

NRA Moves Conservatively

◆ ◆ ◆

Codes Still Johnson Reliance

◆ ◆ ◆

Now Concede Steel's Victory

WASHINGTON

WASHINGTON is doing nothing to correct the superficial deduction that industry in coming before NRA is making a pilgrimage to Canossa and that President Roosevelt and General Johnson are rapping nervous and hesitant executives over the knuckles to drive in codes.

That is understandable both from the viewpoint of practical politics and general prestige. But the fact is that there is now in Washington a perceptible veer toward "the right."

From General Johnson and his deputy administrators down to the bottom tier of officials there is less of a spirit of trying to lead industry and more of a gesture toward cooperation. Each day, as NRA broadens, the confusion increases, but the fact that Washington needs industry as much as industry needs government is breaking through.

The Johnson-Richberg radio interpretation Wednesday night of the labor section—7a—of the recovery act represented a gain for the open shop insofar as it also ruled out the closed shop and for the first time gave official sanction and standing to employe representation plans.

An early, fundamental policy of NRA was that prices were a secondary consideration, to be attended to at some later date, but it is significant that three of the six codes considered thus far—steel, oil and lumber—carry provisions for price control or the practical equivalent.

Industry originally was to be compelled to re-employ enormous numbers of men and women immediately, but the principal effect of codes adopted thus far has been to spread work with no increase in the aggregate of payrolls, to which NRA is not objecting.

This results from the tacit recognition by NRA that industry, after being in "the red" for several years, is in no position to enlarge its outgo at this time. A collateral issue is General Johnson's plan of prodding banks into more liberal credit terms.

Also by laying its financial cards face up on the table and compelling NRA to read them, industry has shaken off the proposal of the "social minds" that it assimilate labor technologically unemployed or permanently released by dying trades.

This is not to say that industry is out of the woods. Organized labor will continue to harass it locally and General Johnson will continue to prod it at Washington, but for the moment it has won a measure of understanding. The danger has been transferred to the social aspect of the entire NRA program.

CHRONOLOGICALLY, when the recovery act was signed and made effective June 16, it was expected that codes for ten "key" industries—including steel—representing 70 per cent of all employment, would come tumbling in.

They didn't, partly because the magnitude of the task was not realized and partly because the success of organized labor in writing the collective bargaining provisions into the act made industry wary.

With a few bold strokes, as he put it, General Johnson proposed to codify industry and sweep it into the bag, and by Labor day 7,000,000 men were to be back at work. When six weeks had elapsed it developed that industry was not sufficiently organized to be codified so swiftly, and that in any event it would not be stampeded.

By late July the enormity of the undertaking was realized by NRA, and the foundations of the consumer drive, getting under way this week, were laid. General Johnson abhors the word, but in Washington the NRA consumer drive is generally regarded as ballyhoo.

This drive is expected to have a certain psychological effect in making the nation conscious that something is being done to lift it out of depression. It is also expected to have some practical result in stimulating buying.

But essentially it will occupy the attention of the nation until the fall upturn in industry has set in. In the last analysis, it is the coded industries and not this consumer drive that Washington regards as the cornerstone of its entire recovery program.

The fact that the steel code was finally approved in substantially its original form with the single exception of the elimination of the open shop provision is filtering through as an evidence of the growing conservatism of NRA and the importance to it of the adherence of this vital industry.

UNQUESTIONABLY, organized labor has overplayed its hand. Flushed with its victory in congress when the recovery act was debated, it undertook to make a clean sweep of NRA.

At the outset, when General Johnson was getting his feet on the ground, it had the advantage of a militant organization and a vigorous, positive stand. It appeared that General Johnson was impressed with labor's hold on congress, and the recollection that labor had largely put Mr. Roosevelt in the White House was fresh.

The record shows that from the start General Johnson stood on the verbiage of the now-famous section 7a, but not so positively that organized labor did not believe that it could get across to workers its contention that only by unionization could the benefits of the act be realized.

Industry was slow in making its showing, but about two weeks ago it became manifest in Washington that if organized labor were not checked

(*Please turn to Page* 43)

July Exports Drop as Scrap Buying Declines; Imports Continue Gain

WHILE steel and iron exports in July show a decline of 14,270 tons from those of June, the second consecutive monthly loss, this was caused by exports of 17,279 tons less of scrap than in June, according to the iron and steel division of the bureau of foreign and domestic commerce, Washington.

Total exports were 88,311 tons in July, compared with 102,581 tons in June. In the face of this loss it is noted that a gain of 3009 gross tons is shown in exports of steel and iron materials in more advanced stage of manufacture. In 36 of 60 classes increased exports were shown. Daily average of exports in July was 2849 tons, compared with 3420 tons in June.

Exports over seven months of 1933, at 615,579 tons, exceeded those of the same period in 1932 by 241,292 tons. The increased export of scrap alone in 1933 over the seven months of 1932 was 22,028 tons greater than this. However, tin plate, seamless casing and oil line pipe, galvanized steel sheets and barbed wire show gratifying growth over 1932. Losses were largest in black steel sheets, skelp, plates and wire rods.

Imports at 52,805 tons were 18,437 tons greater than in June and continue the upward swing of the past five months, interrupted only by the decline in May receipts. For seven months of 1933 imports were 205,283 tons, compared with 227,491 tons in the corresponding period of 1932.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1933		1932	
	Imports	Exports	Imports	Exports
Jan.	21,892	56,720	31,053	40,660
Feb.	19,748	63,936	26,738	40,492
March	22,114	80,567	41,031	49,927
April	28,061	100,395	35,935	58,086
May	26,295	123,069	39,751	80,477
June	34,368	102,581	34,494	52,081
July	52,805	88,311	18,005	52,558
7 mo.	205,283	615,579	227,491	374,287
Aug.	.....	.....	23,623	32,955
Sept.	.....	.....	29,241	36,038
Oct.	.....	.....	33,693	41,226
Nov.	.....	.....	34,924	56,041
Dec.	.....	.....	29,390	54,118
Total	.....	.....	378,282	594,691

ORIGIN OF JULY IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Belgium	100	.....	.....
Netherlands	13,470	.....	39
Norway	500	.....	2,551
United Kingdom	140	.....	185
Canada	50	.....	4,422
Kwantung	147	.....	.....
British India	3,931	.....	.....
British West Africa	.....	4,111	.....
France	.....	.....	21
Italy	.....	.....	34
Total	18,338	4,111	7,252

	Sheets, skelp and sawplate	Structural shapes	Steel bars	Hoops and bands
Belgium	413	1,083	925	1,384
France	284	462	158	229
Germany	5	753	361	192
Sweden	1	.....	121	1
United Kingdom	2	2	34	36
Canada	.....	6	.....	.....
Austria	.....	.....	6	.....
Total	705	2,306	1,605	1,824

Reorganization Proposed For Empire Steel Corp.

A plan of reorganization of the Empire Steel Corp., Mansfield, O., providing for a new company to acquire assets and plants of the corporation, has been mailed to bondholders and general creditors by F. A. Scott, chairman of the reorganization committee. Since May, 1931, the corporation has been operated by a receiver.

The plan provides for the raising of approximately $500,000 new capital through common stock and bonds of a proposed first mortgage bond issue to be authorized by the new company. A new corporation would be formed under Ohio laws, with an authorized capital stock of 125,000 shares of no par common stock and authorized first mortgage bond issue of $1,500,000.

Although the plan as formulated does not contemplate the acquisition of the Cleveland plant of the Empire corporation, this may be agreed upon later. If the bondholders of the Cleveland plant do not join the amount of the new bonds to be issued will not exceed $557,500, plus the amount of new capital raised.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

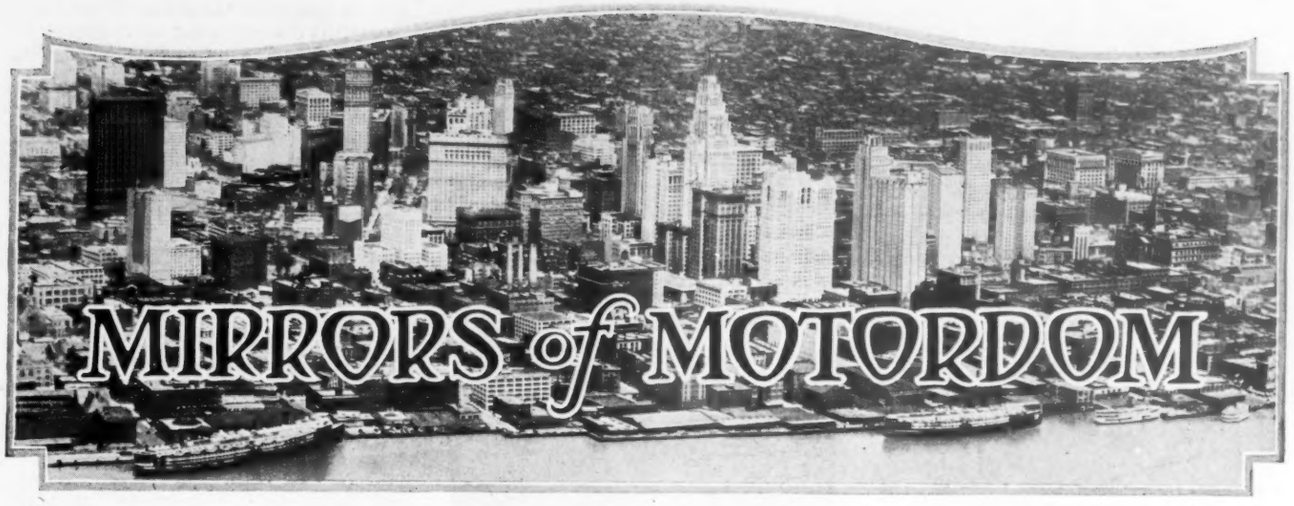
Gross Tons

Commodity	July, 1933	June, 1933	July, 1932
Pig iron	18,339	11,230	673
Sponge iron	52	105	50
Ferromanganese, spiegeleisen	7,252	6,911	999
Ferrochrome	.....	.....	.....
Ferrosilicon	31	47	4
Other ferroalloys	.....	101	33
Scrap	13,391	4,058	95
Steel ingots, blooms, etc.	20	242	43
Concrete bars	122	313	2,027
Hollow bar, drill steel	44	90	92
Merchant steel bars	1,605	1,844	2,396
Iron slabs	.....	.....	.....
Iron bars	48	46	21
Wire rods	1,753	1,431	267
Boiler and other plate	11	8	42
Sheets, skelp, saw plate	705	626	1,187
Tin plate	14	6	15
Structural shapes	2,306	3,329	1,966
Sheet piling	.....	.....	.....
Rails and fastenings	2,581	110	41
Cast-iron pipe, fittings	190	71	176
Welded pipe	475	253	677
Other pipe	166	176	136
Barbed wire	550	368	1,254
Round iron, steel wire	388	169	156
Telegraph, telephone wire	.....	.....	3
Flat wire, strip steel	90	102	567
Wire rope, strand	115	125	70
Other wire	126	105	157
Hoops and bands	1,842	1,955	4,188
Nails, tacks, staples	339	375	1,043
Bolts, nuts, rivets	22	16	17
Horse and mule shoes	56	19	17
Castings, forgings	172	143	84
Totals	52,805	34,368	18,496

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	July, 1933	June, 1933	July, 1932
Pig iron	106	94	146
Ferromanganese, spiegeleisen	3	4	5
Iron and steel scrap	47,552	64,831	23,991
Ingots, blooms, billets, slabs, sheet bars	149	89	28
Bars, iron	96	43	140
Bars, steel	1,873	2,066	820
Bars, alloy steel	129	68	247
Wire rods	1,038	1,312	105
Boiler plate	131	37	72
Other plate, not fabricated	903	435	703
Skelp, iron or steel	3,568	2,570	1,787
Iron sheets, galvanized	141	128	119
Steel sheets, galvanized	2,958	3,278	1,809
Steel sheets, black	2,151	1,876	2,171
Iron sheets, black	133	206	106
Strip steel, cold-rolled	1,158	698	282
Hoop, band and scroll iron or steel	1,563	1,436	1,312
Tin, terne plate	6,276	5,651	2,430
Water, oil, gas, other tanks, except lined	336	329	115
Shapes, not fabricated	299	819	1,012
Shapes, fabricated	865	1,199	728
Plates, fabricated	63	22	93
Metal lath	193	86	154
Frames, sashes and sheet piling	62	198	1,064
Rails, 50 pounds	1,463	385	661
Rails, under 50 pounds	113	139	7
Rail fastenings	179	157	82
Switches, frogs and crossings	58	53	140
Railroad spikes	122	75	57
Railroad bolts, nuts	42	19	16
Boiler tubes, seamless	209	176	398
Boiler tubes, welded	8	60	103
Casing and oil-line pipe, seamless	798	1,411	4,179
Casing and oil-line pipe, welded	794	428	234
Seamless black pipe, other than casing	52	108	72
Malleable-iron screwed pipe fittings	212	159	113
Cast-iron screwed pipe fittings	83	96	59
Cast iron pressure pipe, fittings for	549	1,000	259
Cast iron soil pipe, fittings for	495	450	303
Welded black steel pipe	1,221	1,111	826
Welded black wrought-iron pipe	100	76	410
Welded galvanized steel pipe	2,302	1,561	1,034
Welded galvanized wrought-iron pipe	59	158	29
Riveted iron or steel pipe fittings	25	1	1
Plain iron, steel wire	561	773	258
Galvanized wire	965	921	190
Barbed wire	2,336	2,743	1,123
Woven-wire fencing	54	79	46
Woven-wire screen cloth	77	76	67
Wire rope	203	157	133
Other wire, manufactures	132	264	159
Wire nails	1,026	1,141	935
Horseshoe nails	51	57	34
Tacks	26	23	31
Other nails, staples	245	322	170
Bolts, machine screws, nuts, rivets washers	214	263	250
Iron castings	254	167	219
Steel castings	178	41	61
Car wheels axles	142	285	194
Horseshoes	3	22	3
Iron, steel forgings, n.e.s.	214	149	258
Total gross tons	88,311	102,581	52,553



Coiled Springs for Buick?

Balancers Take More Steel

Sheet "Seconds" Under Fire

DETROIT

WHATEVER the 1934 models will look like when they stand on show room floors next January, they certainly will reflect many innovations in design.

A trend toward the beaver-tail back is noticeable in present plans for future cars. This means three front seats, two rear. Fenderless cars are beyond the experimental stage. All manner of plans for easier riding now are in designing departments. Some of these call for a return to transverse springs, the adoption of coiled springs or novelties in independent wheel suspension.

Buick's plan for independent wheel suspension is slated for its 1934 models. The adoption of this idea will mean the use of coiled springs calling for costlier steel.

Ordinary leaf springs, which until now have been conventional, can be made from regular flat spring stock. Coiled springs must be made from spring steel rolled to far greater precision. A far more exacting heat treatment is necessary. Coiled springs mean discards will be heavier, and Buick's purchasing cost will about double on this one item. The steel supplier, in order to make the correct steel, will be forced to added expense in grinding billets. Billets to make these bars cannot be conventionally chipped.

Buick will be the first in the popular class to put coil springs on assembly-production cars. Cadillac experimented with the Buick wheel suspension feature, but so far has not adopted it. Other General Motors lines, especially those in the price bracket above Buick, may adopt the same wheel-suspension idea.

Consistent with General Motors' design policy for all models in both mechanism and body, it's a safe assumption Buick will not be the lone wolf on an innovation. Though many of the so-called "radical" design departures are not exactly new, nevertheless they always are a novelty when adopted for a popular series.

It looks as though General Motors were embarking on a program that is loosening its tight grip on the conventional. Conservatism always has characterized automobiles General Motors has produced. Because Buick is going to be one of the earliest to change its models, parts suppliers have been asking for prices on steel. One important partsmaker has made a request to mills for protection on steel through March 1.

General Motors now is sounding out all owners of its motorcars on a questionnaire, asking them what they think of fender valances, their ideas on hood louvres, and other features.

PONTIAC and Terraplane according to common opinion, produced the most improved motors in any of the 1933 cars. Pontiac is "standing pat" so far on plans for its 1934 jobs. And, the fact that there will be little change in its models is buoying present sales.

The 8-cylinder power plant promises to be unchanged and the body design will vary little from the present. The fenders, however, are to be changed, and the report is that bracing and heavier-type of construction are planned. A variation of the present valance is to be made, perhaps with more extreme curves, like Oldsmobile's.

A new use for steel will be found in the 1934 Pontiacs. The harmonic balancers are to be made of heavier pieces of steel to take up forward crankshaft thrust. Harmonic balancers, or vibration dampeners as they are known, have been of light gage strip steel, or even of felt, in some automobiles.

Oldsmobile probably will make some revision in the type of wheels it brought out this year. These wheels are a two-piece steel stamping, each fashioned to resemble many spokes. This type wheel has been standard on all models but some trouble has been encountered with mud, water and impediments seeping in.

Free wheeling likely will be on fewer cars next year. Reo's new gearshift-less feature appears to have taken hold so well it may be used elsewhere. A prominent maker is rumored to be considering adopting hydraulic brakes on all its models.

FORD seems set on no such predetermined plans as General Motors does for the usual mid-winter shows. Ford has a new car to show—just what and when is certainly not public knowledge, nor does it appear to be private knowledge.

Reports converge on the probability that the present V-eight type power plant of today's Ford will be toned down and placed in that maker's smaller car to come. Presumably aluminum heads will be discontinued in favor of iron heads, thereby reducing the compression. This move would be caused by need for realignment of the relationship in the motor and lighter body.

Certain deletions on the present Ford body will be made, such as elimination of many of the costlier body "extras." As heretofore said, the wheelbase on the small car planned by Ford will be shorter. But, judging from what Ford has bought for this car, many parts will be interchangeable with the present eight.

The manner in which the V-type engine has been stressed in current Ford advertising precludes adoption of any other type of motor. A cast iron crankshaft with an unusual bearing arrangement may be adopted.

At all events, considerably less gossip rules Detroit over model "44"—for such is the designation of the car Fordson is working on in secret

—than there did two years before when the V-eight came into being.

Frankly, the "44" is looked on as only a step patterned after the move Chevrolet took last spring. Then, Chevrolet offered a standard and a master edition of its six. One was a dressed up job; the other had no frills. No doubt the new Ford will take such a niche beside its larger running mate. If, though, it could sell at the rate of 3000 or 4000 daily it would be a lifesaver to Fordson.

Last week's production at Ford ran to just over the 11,000-mark. Preliminary reports concur that the September schedule will be a reiteration of August's 50,000 jobs. Ford possibly will not close for any extensive period.

A FIRMLY entrenched but detrimental instrument in the steel industry may be dethroned in Detroit soon. This is the brokerage of sheet seconds, influence of which many times has ruined the market for primes.

Brokers in seconds have moved as high as 200,000 tons of sheets in a year's time in this district. Their methods are to buy up mill seconds or wasters and dispose of them to the mill's own customers of prime sheets at anywhere from $5 to $20 a ton, on the average, above the price paid. In one particular instance recently, a Michigan body plant paid $40 a ton over what the seconds cost the broker or jobber.

The worst feature of the entire practice is that the mills themselves cannot dispose of their production of seconds direct to the user, even if they wanted to. One Detroit sheet mill tried it unsuccessfully recently.

Many Michigan sheet buyers have what looks to be a predetermined principle of rejecting a certain percentage of primes, regardless. Yet they will buy seconds in volume.

The story is told in Detroit of a certain body builder a while ago who wasn't interested in 1100 tons of seconds a mill offered direct, but a few weeks later had the 1100 tons of seconds actually in its press room after going through a broker's hands at $40 a ton over the original mill's asking price. The mill had been forced to sell them to the middleman.

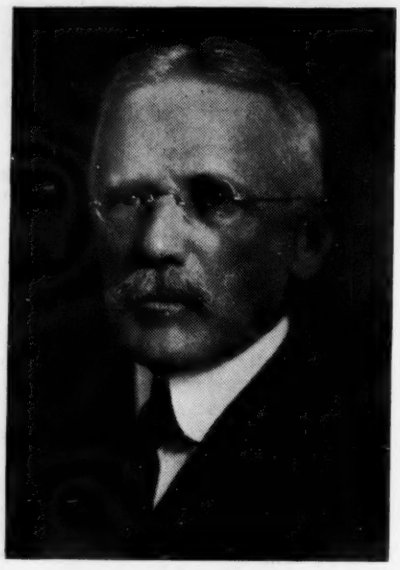
A move now is under way to correct this practice by forcing the sheet mills to dump seconds back in the open hearth.

After making 11,000 cars in July, Hudson is assembling very little less than this figure in August. Sales of the Terraplane, for the twenty-first consecutive week, are reported to have shown a gain . . . . Graham expects to have cleaned up on its present models by Sept. 15. Recently, releases were issued on parts for 1200 additional models, representing the last of this series.

Mather Quits as Head of Cliffs Co.

WILLIAM G. MATHER, one of the best known figures in the iron ore and lake shipping industries and majority stockholder of the Corrigan, McKinney Steel Co., Cleveland, resigned Aug. 24 as president of the Cleveland-Cliffs Iron Co.

For 42 years Mr. Mather, a brother of the late Samuel Mather, has been at the head of the Cleveland-Cliffs company or its predecessor, the Cleveland Iron Mining Co.



William G. Mather

Succeeding Mr. Mather as president of the Cleveland-Cliffs Co., and probably also in the Cliffs Corp., which controls the Cleveland-Cliffs company, is Edward B. Greene, for many years chairman of the executive committee of the Cleveland Trust Co., Cleveland. Mr. Greene will continue his connection with the bank, while Mr. Mather becomes chairman of the Cleveland-Cliffs company, a newly created post.

"Being desirous of having more time for travel and personal matters and feeling that my long service with the company entitles me to relief from the burdens of the presidency, I am glad to relinquish the details of the company's affairs to a younger man, although I expect to remain active in its counsels," said Mr. Mather on presenting his resignation.

Died:

W. D. TYNES, 70, in Birmingham, Ala., Aug. 19. For 35 years he was active in manufacturing in the Birmingham district, and since 1897 a member of the firm of Hardie-Tynes Foundry & Mfg. Co., Birmingham.

□ □ □

S. H. Long, vice president, Wilson Stove & Mfg. Co., Metropolis, Ill., in that city, Aug. 20.

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Kirk S. Kyle, 46, head of the personnel department, Fafnir Bearing Co., New Britain, Conn., in that city.

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Frank A. Colver, 78, founder and owner of the Colver Machine & Iron Works, Frankfort, Ind., in that city, Aug. 7.

□ □ □

Arthur T. North, 69, for several years director of industrial relations for the American Institute of Steel Construction, architect, engineer and formerly engineering editor of *The American Architect*, at New York, Aug. 19.

□ □ □

Lee S. Unger, 62, former assistant superintendent of the Clairton steelworks of Carnegie Steel Co., Pittsburgh, recently at Brownsville, Tex. He was a native of Tarentum, Pa., but had been a resident of Texas since 1930.

□ □ □

J. C. Kortick, president and founder of the Kortick Mfg. Co., San Francisco, in that city, Aug. 15. He was active many years in the iron and steel industry of the Pacific coast and took a prominent part in the Iron, Steel and Allied Industries of California.

□ □ □

Benjamin Thaw Sr., 74, former coke operator, in Pittsburgh, Aug. 19. After graduation from college in 1878 he entered the coke business and with his elder brother, William Thaw Jr., organized the Hecla Coke Co. This company was absorbed by the H. C. Frick Coke Co. in 1905. Mr. Thaw was a trustee of the "coke trust" from 1889 to 1932, created by his father, William Thaw. He was a director of the First National and Peoples-Pittsburgh banks, Pittsburgh.

□ □ □

Roy L. Sanford, 57, senior vice president and San Francisco resident manager of A. M. Castle & Co., Chicago, in San Francisco, Aug. 13. Before he joined the Castle organization in Chicago in 1903 he was for five years with the McAllenan Boiler Co., Peoria, Ill. In 1907 he was sent to San Francisco as Pacific coast manager. When the company opened warehouses in Seattle, San Francisco and Los Angeles several years ago he became senior vice president.

CODE OF FAIR COMPETITION OF THE IRON AND STEEL INDUSTRY

As Approved by Executive Order of the President, Aug. 19, 1933

Text in **black face type** has been added since original draft of code was submitted to NRA

Article I

Definitions

Wherever used in this code or in any schedule appertaining hereto the terms hereinafter in this article and in Schedule E annexed hereto defined shall, unless the context shall otherwise clearly indicate, have the respective meanings hereinafter in this article and in such Schedule E set forth. The definition of any such term in the singular shall apply to the use of such term in the plural and vice versa.

SECTION 1—The term "the United States" means and includes all of the territory of the United States of America on the North American Continent.

SECTION 2—The term 'the President" means the President of the United States of America.

SECTION 3—The term "products" means only pig iron, iron or steel ingots and the rolled or drawn iron or steel products which are generally named in Schedule F to the code as at the time in effect and standard Tee rails of more than 60 pounds per yard, angle bars and rail joints or any of such products.

SECTION 4—The term "the Industry" means and includes the business of producing in the United States and selling products, or any of them.

SECTION 5—The term "member of the Industry" means and includes any person, firm, association or corporation operating a plant or plants in the United States for the production of products, or any of them.

SECTION 6—The term "the Code" means and includes this code and all schedules annexed hereto as originally approved by the President and all amendments hereof and thereof made as hereinafter in Article XII provided.

SECTION 7—The term "member of the Code" means any member of the industry who shall have become a member of the code as hereinafter in Section 3 of Article III provided.

SECTION 8—The term "the Institute" means American Iron and Steel Institute, a New York membership corporation.

SECTION 9—The term "the Board of Directors" means the Board of Directors (as from time to time constituted) of the Institute.

SECTION 10—The term "the Secretary" means the secretary of the Institute at the time in office.

SECTION 11—The term "the Treasurer" means the treasurer of the Institute at the time in office.

SECTION 12—The term "unfair practice" means and includes any act described as an unfair practice in Schedule II annexed hereto.

SECTION 13—Wherever used in the code with reference to the industry or any member of the industry or any member of the code, unless the context shall otherwise clearly indicate:

(a) The term "plant" means only a plant for the production of one or more products in the industry;

(b) The term "prices" includes only prices for products produced in the industry;

(c) The term "wages" includes only wages for labor performed in the industry;

(d) The term "labor" means only labor performed in the industry;

(e) The term "hours of labor" or "hours of work" includes only hours of labor or hours of work in the industry; and

(f) The term "employe" means only an employe in the industry.

SECTION 14—The term "the National Industrial Recovery Act" means the National Industrial Recovery Act as approved by the President June 16, 1933.

SECTION 15—The term "the effective date of the code" means the date on which the code shall have been approved by the President pursuant to the National Industrial Recovery Act.

SECTION 16—The term "the Administrator" means the Administrator appointed by the President under the National Industrial Recovery Act and at the time in office.

SECTION 17—The term "the Administration" means the agency established pursuant to the provisions of Section 2 of the National Industrial Recovery Act.

Article II

Purpose of the Code

SECTION 1—The code is adopted pursuant to Title I of the National Industrial Recovery Act.

SECTION 2—The purpose of the code is to effectuate the policy of Title I of the National Industrial Recovery Act in so far as it is applicable to the industry.

Article III

Membership in the Code

SECTION 1—It is of the essence of the code that all members of the industry which shall comply with the provisions of the code shall be entitled to participate in its benefits upon the terms and conditions set forth in the code.

SECTION 2—Any member of the industry is eligible for membership in the code.

SECTION 3—Any member of the industry desiring to become a member of the code may do so by signing and delivering to the secretary a letter substantially in the form set forth in Schedule A annexed hereto.

SECTION 4—The rules and regulations in respect of meetings of members of the code are set forth in Schedule B annexed hereto.

Article IV

Hours of Labor, Rates of Pay and Other Conditions of Employment

SECTION 1—Pursuant to subsection (a) of Section 7 of the National Industrial Recovery Act and so long as the code shall be in effect, the code shall be subject to the following conditions:

(1) That employes shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

(2) That no employe and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing or assisting a labor organization of his own choosing; and

(3) That employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

(*Statement of open shop principle, in original draft of code, was eliminated by agreement on July* 31, 1933—EDITOR'S NOTE.)

SECTION 2—Since the beginning of the present depression and the consequent reduction in the total number of hours of work available in the industry, its members have made every

effort to distribute, and with remarkable degree of success have distributed, the hours of work available in their plants so as to give employment to the maximum number of employes. It is the intention of the industry to continue that policy in so far as practicable, to the end that the policy of Title I of the National Industrial Recovery Act may be effectuated, and that work in the industry shall, in so far as practicable, be distributed so as to provide employment for the employes normally attached to the industry. The basic processes in the industry are of a continuous character and they cannot be changed in this respect without serious adverse effect upon production and employment. As demand for the products of the industry and therefore for labor shall increase, hours of labor for employes in the industry must necessarily increase; but, except in the case of executives, those employed in supervisory capacities and in technical work and their respective staffs and those employed in emergency work, in so far as practicable and so long as employes qualified for the work required shall be available in the respective localities where such work shall be required and having due regard for the varying demands of the consuming and processing industries for the respective products, none of the members of the code shall cause or permit any employe to work at an average of more than 40 hours per week in any six months period **or to work more than 48 hours or more than six days in any one week. On or after Nov. 1, 1933, as soon as the members of the code shall be operating at 60% of capacity, they shall adjust the operations of their plants so that, except as to executives, those employed in supervisory capacities and in technical work and their respective staffs and those employed in emergency work, they will establish the eight-hour day for all their employes.** For the purpose of this Section 2 the first six months period for each employe in the employ of any member of the code at the effective date thereof shall begin with that date, and the first six months period for any employe thereafter employed by any member of the code shall begin with the date of employment of such employe by such member. After the date of the employment by any member of the code of any employe such member shall not knowingly permit such employe who also shall have performed work for one or more other employers to work for such member such number of hours as would result in a violation of the code had all such work been performed for such member.

SECTION 3—None of the members of the code shall employ in or about its plants in the industry any person under sixteen years of age.

SECTION 4—Throughout the history of the industry geographical wage differentials have existed due in the main to differences in living costs and general economic conditions and the ability adequately to man the industries in the respective localities. The establishments in the industry in the different localities have been developed under such differences in wages and, after a survey of the matters bearing on such differences in the various sections of the United States, for the purposes of this Article IV the wage districts described in Schedule D annexed hereto have been established.

SECTION 5—Until changed by amendment of the code as hereinafter in Article XII provided, the minimum rates of pay per hour which shall be paid by members of the code for common labor (not including that of apprentices and learners) in the industry in the respective wage districts described in such Schedule C shall be the rates set forth in Schedule D annexed hereto. None of the members of the code shall pay common laborers (not including apprentices and learners) in its employ in the industry in any such district any rate of pay less than the rate specified for such district in such Schedule D, and any violation of this provision of the code shall be deemed an unfair practice. Such rates of pay shall not, however, be understood to be the maximum rates of pay for their respective districts, but, until changed as aforesaid, none of the members of the code shall be required to pay its common laborers in the industry in any of such districts a rate of pay higher than the rate specified for such district in such Schedule D, except as such member shall have agreed to pay such higher rate in any agreement heretofore or hereafter made by such member with its employes. Until this provision shall have been changed by amendment as aforesaid, each member of the code will pay to each of its employes in the industry who on July 14, 1933, was receiving pay at a rate of pay per hour in excess of the rate of pay per hour then being paid by such member for common labor a rate of pay per hour which shall be at least 15% greater than that which such employe was then receiving, provided, however, that the foregoing provision shall not be so construed as to require any member of the code to make any increase in the rate of pay per hour to be paid by such member to any of its employes in any wage district that will result in a rate of pay per hour which shall be higher than the rate of pay per hour paid to employes doing substantially the same class or kind of labor in the same wage district by any other member of the code which shall have increased its rates of pay per hour in accordance with such provision. In the case of employes (not including apprentices and learners) performing work for which they are paid per piece of work performed, the minimum rate of pay which each member of the code shall pay for such work shall be sufficient to produce at the average rate of performance of such work at the time prevailing at the plant of such member where such work is performed the minimum rate of pay per hour provided in the code for common labor at such plant.

Article V

Production and New Capacity

SECTION 1—It is the consensus of opinion in the industry that it is not necessary, in order to effectuate the policy of Title I of the National Industrial Recovery Act, to make any specific provision in the code for controlling or regulating the volume of production in the industry or for allocating production or sales among its members. It is believed that the elimination of unfair practices in the industry will automatically eliminate any overproduction therein and any alleged inequities in the distribution of production and sales among its members. Adequate provision shall be made under the code for the collection of statistics regarding production and of other data from which it may be determined from time to time whether overproduction in the industry exists and whether in the circumstances any restriction of production is necessary in order to effectuate the policy of such Title I. **The board of directors shall furnish to the Administrator summaries or compilations of such statistics and other data in reasonable detail.** Should it at any time in the circumstances as they shall then exist appear to the board of directors that the policy of such Title I will not be effectuated in the industry because of the fact that through the code production therein is not controlled and regulated, then the board of directors is hereby empowered, subject to the approval of the President after such conference with or hearing of interested persons as he may prescribe, to make, modify or rescind such rules and regulations for the purpose of controlling and regulating production in the industry, including the fixing of such liquidated damages for violations of such rules and regulations as such board shall deem to be necessary or proper in order to effectuate the policy of such Title 1. All such rules and regulations from time to time so made and in effect shall be binding upon each member of the code to which notice thereof shall have been given.

SECTION 2—It is also the consensus of opinion in the industry that, until such time as the demand for its products cannot adequately be met by the fullest possible use of existing capacities for producing pig iron and steel ingots, such capacities should not be increased. According-

ly, unless and until the code shall have been amended as hereinafter provided so as to permit it, none of the members of the code shall initiate the construction of any new blast furnace or open hearth or Bessemer steel capacity. **The President may, however, suspend the operation of the provisions of this section.**

Article VI

Administration of the Code

SECTION 1—The administration of the code shall be under the direction of the board of directors. The board of directors shall have all the powers and duties conferred upon it by the code and generally all such other powers and duties as shall be necessary or proper to enable it fully to administer the code and to effectuate its purpose.

SECTION 2—The secretary shall act as secretary under the Code. Under the direction of the board of directors, he shall keep all books (except books of account) and record under the code, and except as such board shall otherwise provide, shall collect, file and collate all statistics and other information required by the board of the directors for the proper administration of the code.

SECTION 3—The treasurer shall act as treasurer under the code and, under the direction of the board of directors, he shall have custody of, and have charge of the disposition of, all funds collected under the code; and he shall keep proper books of account showing the collection and disposition thereof.

SECTION 4—The board of directors shall have power from time to time (a) to appoint and remove, and to fix the compensation of, all such other officers and employes and all such accountants, attorneys and experts, as said board shall deem necessary or proper for the purpose of administering the code, and (b) to fix the compensation of the secretary and the treasurer for their services in acting under the code.

SECTION 5—The expenses of administering the code shall be borne by the members thereof. The board of directors may from time to time make such assessments on account of such expenses against the members of the code as it shall deem proper and such assessments shall be payable as such board shall specify. The part of such expenses which shall be assessed against each member of the code shall bear the same relation to the total thereof as the number of votes which, pursuant to the provisions of the code, such member might cast at a meeting of the members thereof held at the time of any such assessment shall bear to the total number of votes that might be cast thereat by all the then members of the code. Failure of any member of the code to pay the amount of any assessment against such member for a period of thirty days after the date on which it became payable shall constitute a violation of the code.

SECTION 6—The board of directors may from time to time appoint such committees as it shall deem necessary or proper in order to effectuate the purpose of the code, and it may delegate to any such committee generally or in particular instances such of the powers and duties of the board of directors under the code as such board shall deem necessary or proper in order to effectuate such purpose. Any member of any such committee may be a member of the board of directors or an officer or a director of a member of the code or a person not having any official connection with any member of the code or with the institute, as the board of directors shall deem proper.

SECTION 7—**The members of the code recognize that questions of public interest are or may be involved in its administration. Accordingly, representatives of the Administration consisting of the Administrator and one or two other persons appointed by him (who shall be persons not having or representing interests antagonistic to the interests of members of the industry) shall be given full opportunity at such times as shall be reasonably convenient to discuss with the board of directors or any committees thereof any matters relating to the administration of the code and to attend meetings of the board at which action on any such matters shall be undertaken and to make recommendations as to methods or measures of administering the code. Due notice of all such meetings of the board of directors shall be given to such representatives of the administration. The records of the board of directors relating in any way to the administration of the code shall be open to such representatives at all reasonable times. They shall be afforded by the board of directors complete access at all times to all records, statistical material or other information furnished or readily available to the board of directors in connection with, or for the purposes of, the administration of the code. The board of directors, acting directly or through one or more committees appointed by it, shall give due consideration to all requests, suggestions or recommendations made by such representatives of the Administration and render every possible assistance to such representatives in obtaining full information concerning the operation and administration of the code, to the end that the President may be fully advised regarding such operation and administration through reports that may be made to him from time to time by such representatives, and to the end that the President may be assured that the code and the administration thereof do not promote or permit monopolies or monopolistic practices, or eliminate or oppress small enterprises, or operate to discriminate against them and do provide adequate protection of consumers, competitors, employes and others concerned and that they are in furtherance of the public interest and operate to effectuate the purposes of Title I of the National Industrial Recovery Act.**

Article VII

Prices and Terms of Payment

None of the members of the code shall make any sale of any product at a price or on terms and conditions more favorable to the purchaser thereof than the price, terms or conditions established by such member in accordance with the provisions of Schedule E annexed hereto and in effect at the time of such sale; nor, except as otherwise provided in such Schedule E, shall any member of the code make any contract of sale of any product at a price or on terms and conditions more favorable to the purchaser thereof than the price, terms and conditions established as aforesaid and in effect at the time of making of such contract of sale.

Article VIII

Unfair Practices

For all purposes of the code the acts described in Schedule H annexed hereto shall constitute unfair practices. Such unfair practices and all other practices which shall be declared to be unfair practices by the board of directors as provided in paragraph M of such Schedule H or by any amendment to the code adopted as hereinafter in Article XII provided and at the time in effect shall be deemed to be unfair methods of competition in commerce within the meaning of the Federal Trade Commission Act as amended, and the using or employing of any of them shall be deemed to be a violation of the code, and any member of the industry which shall directly, or indirectly through any officer, employe, agent or representatives, knowingly use or employ any of such unfair practices shall be guilty of a violation of the code.

Article IX

Reports and Statistics

SECTION 1—The board of directors shall have power from time to time to require each member of the code to furnish to the secretary for the use of the board of directors such information concerning the production, shipments, sales and unfilled orders of such member and the hours of labor, rates of pay and other conditions of employment at the plant or plants of such member and such other information as the board of directors shall

deem necessary or proper in order to effectuate the purpose of the code and the policy of Title I of the National Industrial Recovery Act. The board of directors may require that any such information be furnished periodically at such times as it shall specify and may require that any or all information furnished be sworn to or otherwise certified or authenticated as it shall prescribe. Failure of any member of the code promptly to furnish to the secretary information required by the board of directors and substantially in the form prescribed by it shall constitute a violation of the code. The board of directors shall not require any information regarding trade secrets or the names of the customers of any member of the code.

SECTION 2—Any or all information furnished to the secretary by any member of the code shall be subject to checking for the purpose of verification by an examination of the books and accounts and records of such member by any acocuntant or accountants or other person or persons designated by the board of directors and shall be so checked for such purpose, if the board of directors shall require it. The cost of each such examination shall be treated as an expense of administering the code; provided, however, that, if upon such examination any such information shall be shown to have been incorrect in any material respect, such cost shall be paid by the member of the code which furnished such information.

SECTION 3—The board of directors shall require the members of the code from time to time to furnish such information as shall be necessary for the proper administration of the code.

SECTION 4—To the extent that the board of directors may deem that any information furnished to the secretary in accordance with the provisions of the code is of a confidential character in the interest of the member of the code which shall have furnished it and that the publication thereof is not essential in order to effectuate the policy of Title I of the National Industrial Recovery Act, such information shall be treated by the board of directors and by the other members of the code, if any knowledge of it shall have come to them, as strictly confidential; and no publication thereof to anyone or in any manner shall be made other than in combination with similar information furnished by other members of the code, in which case the publication shall be made only in such manner as will avoid the disclosing separately of such confidential information.

SECTION 5—**Summaries or compilations in reasonable detail of all information which shall be furnished to the secretary pursuant to the provisions of this Article IX shall be made periodically and sent to the Administrator.**

Article X

Penalties and Damages

SECTION 1—Any violation of any provision of the code by any member of the industry shall constitute a violation of the code by such member.

SECTION 2—Recognizing that the violation by any member of the code of any provision of Article VII or of Schedule E of the code will disrupt the normal course of fair competition in the industry and cause serious damage to other members of the code and that it will be impossible fairly to assess the amount of such damage to any member of the code, it is hereby agreed by and among all members of the code that each member of the code which shall violate any such provision shall pay to the treasurer as an individual and not as treasurer of the institute, in trust, as and for liquidated damages the sum of $10 per ton of any products sold by such member in violation of any such provision.

SECTION 3—Except in cases for which liquidated damages are fixed in the code and in cases which shall give rise to actions in tort in favor of one or more members of the code for damages suffered by it or them, the board of directors shall have power from time to time to establish the amount of liquidated damages payable by any member of the code upon the commission by such member of any act constituting an unfair practice under the code and a list of the amounts so fixed shall from time to time be filed with the secretary. Upon the commission by any member of the code of any act constituting an unfair practice under the code and for which liquidated damages are not fixed in the code or which does not give rise to an action in tort in favor of one or more members of the code for damages suffered by it or them, such member shall become liable to pay to the treasurer as an individual and not as treasurer of the institute, in trust, liquidated damages in the amount at the time established by the board of directors for such unfair practice and specified in the list then on file with the secretary as aforesaid.

SECTION 4—All amounts so paid to or collected by the treasurer under this Article X or under Section 4 of Schedule E of the code shall be held and disposed of by him as part of the funds collected under the code and each member of the code not guilty of the unfair practice in respect of which any such amount shall have been paid or collected shall be credited with its pro rata share of such amount on account of any and all assessments (other than damages for violation of any provision of the code) due or to become due from such member under the code, **or, in the case of any excess, as shall be determined by the board of directors,** such pro rate share to be computed on the same basis as the last previous assessment made against such member on account of the expenses of administering the code as hereinbefore in Section 5 of Article VI provided. All rights of any person who shall at any time be the treasurer in respect of any amounts which shall be payable to him because of the commission by any member of the code of any act constituting an unfair practice under the code, whether payable under the provisions of this Article X or under any other provision of the code, shall pass to and become vested in his successor in office upon the appointment of such successor.

SECTION 5—Each member of the code by becoming such member agrees with every other member thereof that the code constitutes a valid and binding contract by and among all members of the code, **subject, however, to the provisions of Section 6 of Article XI,** and that, in addition to all penalties and liabilities imposed by statute, any violation of any provision of the code by any member thereof shall constitute a breach of such contract and shall subject the member guilty of such violation to liability for liquidated damages pursuant to the provisions of the code. Each member of the code by becoming such member thereby assigns, transfers and delivers to the treasurer as an individual and not as treasurer of the institute, in trust, all rights and causes of action whatsoever which shall thereafter accrue to such member under the code for such liquidated damages by reason of any violation of the code by any other member thereof, and thereby designates and appoints, the treasurer as such individual the true and lawful attorney-in-fact of such member to demand, sue for, collect and receipt for any and all amounts which shall be owing to such member in respect of any such right or cause of action, and to compromise, settle, satisfy and discharge any such right or cause of action, all in the name of such member or in the name of the treasurer individually, as he shall elect.

SECTION 6—Anything in the code to the contrary notwithstanding, the board of directors by the affirmative vote of two-thirds of the whole board may waive any liability for liquidated damages imposed by or pursuant to any provision of the code for any violation of any provision thereof, if in its discretion it shall decide that such violation was innocently made and that the collection of such damages will not to any material extent tend to effectuate the policy of Title I of the National Industrial Recovery Act.

Article XI

General Provisions

SECTION 1—Any notice, demand or

request required or permitted to be given to or made upon any member of the code shall be sufficiently given if mailed postage prepaid addressed to such member at the address of such member on file with the secretary. A waiver in writing signed by any member of the code of any such notice, demand or request and delivered to the secretary shall be deemed to be the equivalent of a notice, demand or request duly given or made, whether or not such waiver was signed and delivered before the time when such notice, demand or request was required or permitted to be given or made.

SECTION 2—Nothing contained in the code shall be liable in any manner to members of the code partners for any purpose. None of the members of the code shall be liable in any manner to anyone for any act of any other member of the code or for any act of the board of directors, the treasurer or the secretary, or any committee, officer or employe appointed under the code. None of the members of the board of directors or of any committee appointed under the code, nor the treasurer, nor the secretary, nor any officer or employe appointed under the code, shall be liable to anyone for any action or omission to act under the code, except for his wilful misfeasance or nonfeasance. Nothing contained in the code shall be deemed to confer upon anyone other than a member of the code any right, claim or demand whatsoever **not expressly provided by statute** against any member of the code or against any member of the board of directors or of any committee appointed under the code or against the treasurer or the secretary or any officer or employe appointed under the code.

SECTION 3—As soon as members of the industry which would, if then members of the code, have the right to cast at least 75% of all the votes that might be cast at a meeting of the members of the code, if all members of the industry were then members of the code and present at such meeting, shall sign and deliver to the secretary letters substantially in the form set forth in Schedule A annexed hereto, the board of directors shall submit the code to the President pursuant to the provisions of Title I of the National Industrial Recovery Act and, upon the approval of the code by the President pursuant to the provisions of such Title I, it shall constitute a binding contract by and among the members of the code and the provisions thereof shall be the standards of fair competition for the industry; subject, however, to amendment or termination as hereinafter in Article XII provided, **and subject also to the provisions of Section 6 of this Article XI.**

SECTION 4—To the extent required or made possible by or under the provision of Title I of the National Industrial Recovery Act the provisions of the code shall apply to and be binding upon every member of the industry, whether or not such member shall be a member of the code. No member of the industry which shall not also be a member of the code shall be entitled to vote at any meeting of members of the code or to any other right, power or privilege provided in the code for the members thereof.—(*Foregoing text changed slightly—Editor.*)

SECTION 5—The board of directors shall have power from time to time to interpret and construe the provisions of the code, including, but without any limitation upon the foregoing, the power to determine what are products within the meaning of that term as it is used in the code. Any interpretation or construction placed upon the code by the board of directors shall be final and conclusive upon all members of the code.

SECTION 6—**The members of the code recognize that,** pursuant to subsection (b) of Section 10 of the National Industrial Recovery Act, the President may from time to time cancel or modify any order, approval, license, rule or regulation issued under Title I of said Act.

Article XII

Amendments—Termination

SECTION 1—The code may be amended at any time in the manner in this Section 1 provided. The changing of any schedule hereto or the addition hereto of any new schedule shall constitute an amendment of the code. All amendments shall be proposed by the board of directors by vote of the majority of the members thereof at the time in office. Each amendment so proposed shall be submitted to a meeting of the members of the code which shall be called for such purpose upon notice given in accordance with the provisions of Section 1 of Schedule B and Section 1 of Article XI of the code. If at such meeting members of the code having the right to cast at least 75% of all the votes that might be cast at such meeting, if all the members of the code were present thereat, shall vote in favor of the adoption of such amendment, such amendment shall be submitted by the board of directors to the President for approval, if approval thereof by him shall then be required by law. Every such amendment shall take effect as a part of the code upon the adoption thereof by the members of the code as above provided and the approval thereof by the President, if approval thereof by him shall be required as aforesaid.

SECTION 2—The code shall continue in effect for a period of ninety (90) days after the effective date thereof, **in order to afford to the President an opportunity to determine upon the recommendations of the representatives of the Administration, for which provision has heretofore been made in Article VI, whether its provisions will effectuate the purposes of Title I of the National Industrial Recovery Act, as further defined in said Article VI, subject, however, to amendment at any time as hereinbefore provided, and also subject to the reserved power of the President to cancel or modify his approval thereof. The code shall continue in effect after the expiration of said period of ninety (90) days in the absence of the exercise of such reserved power on the part of the President, or in the absence of the exercise by members of the code of the power which they hereby reserve to terminate the code at any time after the expiration of said period of ninety (90) days by the same action by them** as is above provided for the amendment thereof. When so terminated all obligations and liabilities under the code shall cease, except those for unpaid assessments theretofore made in accordance with the provisions of the code and those for liquidated damages theretofore accrued under any provision of the code.

Aug. 17, 1933.

Schedule A

Form of Letter of Assent to the Code

To the Secretary of
American Iron and Steel Institute,
Empire State Building,
New York, N. Y.

Dear Sir:

The undersigned, desiring to become a member of the Code of Fair Competition of the Iron and Steel Industry, a copy of which is annexed hereto marked Annex A, hereby assents to all of the provisions of said code (hereinafter referred to as the code), and, effective as of the date on which the code shall have been approved by the President of the United States of America as therein provided, or as of the date on which this letter shall have been delivered, if delivery thereof shall have been made subsequent to the date of which the code shall have been approved by said President as aforesaid, by the signing and delivery of this letter becomes a member of the code and effective as aforesaid, hereby agrees with every person, firm, association and corporation who shall then be or thereafter become a member of the code that the code shall constitute a valid and binding contract between the undersigned and all such other members.

Effective as aforesaid, pursuant to Section 5 of Article X of said code, the undersigned (a) hereby assigns, transfers and delivers to the treasurer under the code, as an individual and not as treasurer of American Iron and Steel Institute, in trust, all rights and causes of action whatsoever hereafter accruing to the undersigned under the code for

liquidated damages by reason of any violation thereof by anyone, and (b) hereby designates and appoints said treasurer as such individual the true and lawful attorney-in-fact of the undersigned, to demand, sue for, collect and receipt for any and all amounts which shall be owing to the undersigned in respect of any such right or cause of action, and to compromise, settle, satisfy and discharge any such right or cause of action, all in the name of the undersigned or in the name of said treasurer, as said treasurer shall elect.

For all purposes of Section 1 of Article XI of the code the address of the undersigned, until it shall file with the secretary of the American Iron and Steel Institute written notice of a change of such address, shall be as set forth at the foot of this letter.

Very truly yours,

Address:

Schedule B

The Rules and Regulations in Respect of Meetings of Members of the Code

SECTION 1—A meeting of members of the code may be called and held at any time by order of the board of directors, or by members of the code having the right to cast at least 50% of all the votes that might be cast at such meeting, if all the members of the code were present thereat, on not less than three days' notice to each of such members stating the time and place of such meeting and the purposes thereof.

SECTION 2—At each meeting of the members of the code each member thereof shall have as many votes as shall equal the quotient obtained by dividing by 500,000 the aggregate amount in dollars of the invoicing value of the products delivered by each member for consumption within the United States during the preceding calendar year. Fractions in such quotient shall be disregarded; provided, however, that each member of the code shall have at least one vote. All questions as to the number of votes which each member of the code shall be entitled to cast at any meeting of the members thereof shall be determined by the board of directors. Any person or firm who shall be a member of the code may, and any association or corporation which shall be a member of the code shall, vote at meetings of the code by proxy in writing duly executed by such member and filed with the secretary. Any such proxy may be for a specified meeting or be a general proxy for any or all meetings that may be held until such proxy shall have been revoked by an instrument in writing duly executed by the member of the code which gave such proxy and filed with the secretary.

SECTION 3—At each meeting of the members of the code, members thereof having the right to cast at least 75% of all the votes that might be cast at such meeting, if all the members of the code were present thereat, shall constitute a quorum for the transaction of business at such meeting.

Schedule C

Schedule C in the original draft was a statement of the fundamental principles of employe representation plans. It was eliminated at the hearing on July 31. Therefore old Schedule D now is designated as Schedule C, old Schedule E as D, etc.—EDITOR'S NOTE.

Description of Wage Districts

1. EASTERN DISTRICT: Comprises that part of the United States which is north of the state of Virginia and east of a line drawn north and south through the most easterly point of Altoona, Pennsylvania; that part of the state of Maryland which is west of such line; and the counties of Monongahela, Marion and Harrison in the state of West Virginia.

2. JOHNSTOWN DISTRICT: Comprises Cambria County and the city of Altoona in the state of Pennsylvania.

3. PITTSBURGH DISTRICT: Comprises the counties of Westmoreland, Fayette, Greene, Washington, Allegheny, Beaver, Butler, Armstrong and Jefferson, and that part of the county of Clearfield which is west of a line drawn north and south through the most easterly point of Altoona, all in the state of Pennsylvania.

4. YOUNGSTOWN VALLEY DISTRICT: Comprises the counties of Lawrence, Mercer and Venango in the state of Pennsylvania, and the counties of Trumbull, Mahoning and Columbiana in the state of Ohio.

5. NORTH OHIO RIVER DISTRICT: Comprises the cities along the Ohio River north of the city of Parkersburg, West Virginia, and the counties of Belmont and Jefferson in the state of Ohio and the counties of Marshall, Ohio, Brook and Hancock in the state of West Virginia.

6. CANTON, MASSILLON AND MANSFIELD DISTRICT: Comprises the counties of Stark, Tuscarawas, Summit and Richland in the state of Ohio.

7. CLEVELAND DISTRICT: Comprises the counties of Ashtabula, Lake, Cuyahoga and Lorain in the state of Ohio.

8. BUFFALO DISTRICT: Comprises that part of the state of New York west of a line drawn north and south through the most easterly point of Altoona, Pennsylvania, and Erie County in that state.

9. DETROIT-TOLEDO DISTRICT: Comprises the counties of Seneca and Lucas in the state of Ohio and the counties of Monroe, Lenawee, Jackson, Wayne, Oakland, Macomb and Washtenaw in the state of Michigan.

10. SOUTH OHIO RIVER DISTRICT: Comprises the state of Kentucky, the city of Parkersburg, West Virginia, the cities along the Ohio river south of said city, the counties of Guernsey, Muskingum, Jackson and Butler in the state of Ohio and the county of Wood in the state of West Virginia.

11. INDIANA-ILLINOIS-ST. LOUIS DISTRICT: Comprises all of the state of Indiana, except the county of Lake; all of the state of Illinois, except the counties of Lake and Du Page and the Chicago Switching District; the city of St. Louis and the county of St. Louis in the state of Missouri; and the county of Rock in the state of Wisconsin.

12. CHICAGO DISTRICT: Comprises the Chicago Switching District; the counties of Lake and Du Page in the state of Illinois; the county of Lake in the state of Indiana; and the counties of Kenosha, Racine and Milwaukee in the state of Wisconsin.

13. SOUTHERN DISTRICT: Comprises all that part of the United States south of the states of Maryland, West Virginia, Kentucky and Missouri, and the states of Texas and Oklahoma, but does not include the county of Jefferson in the state of Alabama.

14. BIRMINGHAM DISTRICT: Comprises the county of Jefferson in the state of Alabama.

15. KANSAS CITY DISTRICT: Comprises the county of Jackson in the state of Missouri.

16. DULUTH DISTRICT: Comprises the county of St. Louis in the state of Minnesota.

17. COLORADO DISTRICT: Comprises the state of Colorado.

18. UTAH DISTRICT: Comprises the state of Utah.

19. SEATTLE DISTRICT: Comprises the county of King in the state of Washington and the county of Multonomah in the state of Oregon.

20. SAN FRANCISCO DISTRICT: Comprises the counties of San Mateo, Alameda, Sacramento and Contra Costa in the state of California.

21. LOS ANGELES DISTRICT: Comprises the county of Los Angeles in the state of California.

Schedule D

Minimum Rates of Pay for Common Labor

	Cents per hour
1—Eastern District	35
2—Johnstown District	37
3—Pittsburgh District	40
4—Youngstown Valley District	40
5—North Ohio River District	40
6—Canton, Massillon and Mansfield District	37
7—Cleveland District	40
8—Buffalo District	38
9—Detroit-Toledo District	40
10—South Ohio River District	37
11—Indiana-Illinois-St. Louis District	37
12—Chicago District	40
13—Southern District	25
14—Birmingham District	27
15—Kansas City District	35
16—Duluth District	37
17—Colorado District	40
18—Utah District	39
19—Seattle District	38
20—San Francisco District	37
21—Los Angeles District	35

Schedule E

Concerning Prices and Terms of Payment

SECTION 1—Wherever used in the code the terms hereinafter in this Section 1 defined shall, unless the context shall otherwise clearly indicate, have the respective meanings hereinafter in this Section 1 set

forth. The definition of any such term in the singular shall apply to the use of such term in the plural and vice versa.

(a) Until Schedule F of the code shall have been amended as in Article XII of the code provided, the term "basing point" for any product means one of the places listed in such Schedule F as a basing point for such product. Thereafter the term shall mean one of the places listed in such Schedule F as at the time in effect as a basing point for such product.

(b) The term "base price" of any product means the price for such product f.o.b. a basing point, before any extras in respect of such product shall be added or any discounts for early payment or deductions shall be allowed or made.

(c) The term "period of free credit" means the period of time between the date of a shipment of a product to the purchaser of such product and the date from and after which such purchaser shall be required to pay interest on the purchase price of such product or any part thereof which shall not have been paid prior to the expiration of such period.

(d) The term "date of invoice" means the date of the invoice of any product.

(e) The term "discount for early payment" means the amount of the deduction allowed for the payment of an invoice of products before the expiration of the period of free credit in respect thereof.

(f) The term "an affiliated group" means one or more corporations connected through stock ownership with a common parent corporation, if (1) at least 75 per cent of the stock of each of such corporations (except such common parent corporation) is owned directly by one or more of the other corporations, and (2) such common parent corporation owns directly at least 75 per cent of the stock of at least one of the other corporations. The term "an affiliated company of a member of the code" means (1) a corporation which is one of an affiliated group that also includes such member of the code, or (2), in case the member of the code is a person, firm or association, a corporation at least 75 per cent of the stock of which is owned by such member. For the purpose of this paragraph (f) the term "stock" does not include non-voting stock which is limited and preferred as to dividends.

SECTION 2—Each member of the code shall, within ten days after the effective date of the code, file with the secretary a list showing the base prices for all its products, and from and after the expiration of such ten days such member shall at all times maintain on file with the secretary a list showing the base prices for all its products and shall not make any change in such base prices except as provided in this Schedule E. Each such list shall state the date upon which it shall become effective, which date shall be not less than ten days after the date of filing such list with the secretary; provided, however, that the first list of base prices filed by any member of the code as above provided shall take effect on the date of filing thereof. None of the base prices shown in any list filed by any member of the code as herein provided shall be changed except by the filing by such member with the secretary of a new list of its base prices, which shall become effective on the effective date therein specified which shall become effective on the effective date therein specified which shall not be less than ten days after the date on which such new price lists shall have been so filed. In the case of pipe of sizes or kinds which are sold on a list and discount basis, for the purposes of this Section 2 the list of base prices shall consist of a price list and one or more basing discount lists, from which the base prices of such pipe shall be determined; provided, however, that in the case of oil country tubular goods there shall be filed in lieu of a list of base prices a price list and one or more basing discount lists from which the delivered prices of such goods shall be determined.

In Section 3 of the original draft reference was made to "standard Tee rails of 60 pounds per yard and heavier." In the final draft, this wording is changed to "standard Tee rails of more than 60 pounds per yard, angle bars and rail joints."—EDITOR'S NOTE.

SECTION 3—Except as hereinafter otherwise provided in respect of standard Tee rails of more than 60 pounds per yard, angle bars and rail joints, the base price for any product shown in any list of base prices filed by a member of the code in accordance with the provisions of the foregoing Section 2 shall be as follows: (a) If such member shall operate a plant for the production of such product which is located at a basing point for such product, f.o.b. such basing point, or (b), if such member shall operate a plant for the production of such product which is not located at a basing point for such product, f.o.b. the basing point for such product nearest in terms of all-rail freight rates to such plant, or (c), if any Gulf or Pacific Coast port shall be listed as a basing point in Schedule F of the code as at the time in effect, f.o.b. **cars dock** such port. Except as otherwise provided in this Schedule E, each member of the code shall file with the secretary and maintain on file with him a list showing the base price for each of its products for each basing point for such product at which a plant of such member for the manufacture of such product shall be located and for each basing point for such product which shall be nearest in terms of all-rail freight rates to any plant of such member for the manufacture of such product not located at a basing point for such product; and, if any Gulf or Pacific Coast port shall be listed in such Schedule F as a basing point for a product, such member may show in such list its base price for such product at such basing point. All base prices shown in the list so filed shall constitute the published base prices of such member for the products and for the basing points shown in such list. Except as aforesaid, none of the members of the code shall file any list of base prices showing any price for any of its products other than the base prices for such products f.o.b. the basing point or basing points for such product as hereinbefore provided. The published base price of each such member for any product (except standard Tee rails of more than 60 pounds per yard, angle bars and rail joints) for any basing point for such product other than that or those shown in the list of base prices so filed by such member shall be deemed to be the lowest base price for such product at such other basing point which shall be shown in the list of base prices filed by any other member of the code and then in effect. All base prices for standard Tee rails of more than 60 pounds per yard and all base prices for angle bars and rail joints shall be f.o.b. mill of the producer thereof, or, in the case of rails, angle bars and rail joints carried by water from any Atlantic Coast or Gulf port to any Gulf or Pacific Coast port, c.i.f. the port of destination. Lists of prices filed with the secretary pursuant to the foregoing Section 2 and to this Section 3 shall be open to inspection at all reasonable times by anyone.—*In the original draft the word "anyone" was followed by "having an interest therein."*—EDITOR'S NOTE.

Section 4—Except as otherwise provided in this Schedule E of the code, all prices quoted and billed by any member of the code for any product (except standard Tee rails of more than 60 pounds per yard, angle bars and rail joints and oil country tubular goods, which shall be quoted and billed as hereinafter provided) sold by such member from and after ten days after the effective date of the code shall be delivered prices, which (disregarding the extras, if any, required by, and the deductions, if any, that may be made pursuant to, the provisions of the code) shall be not less than the sum of (a) the published base prices of such member for such product effective at the time of the sale thereof and (b) the all-rail published tariff freight charges from the basing point on which such base price is based to the place of delivery to the purchaser thereof or, (1) if such place of delivery shall be at such basing point, the published tariff switching charges to such place of delivery from the plant of any member of the code for the production of such product at such basing point nearest in terms of such switching charges to such place of delivery; or (2) if such place of delivery shall be at a Gulf

or Pacific port that is listed in Schedule F as a basing point, the published tariff switching charges to such place of delivery from the dock for discharging products nearest in terms of such switching charges to such place of delivery; provided, however, that (a) in any case in which such product shall be delivered by other than all-rail transportation, the member of the code selling such product may allow the purchaser a reduction in the delivered price otherwise chargeable under this Section 4 at a rate which shall have been previously approved by the board of directors and filed with the secretary; and (b) in the case of plates, shapes or bars intended for fabrication for an identified structure, for the purpose of establishing the delivered price thereof, the place of delivery shall be deemed to be the freight station at or nearest to the place at which such structure is to be erected, and not the shop of the fabricator; and (c) subject as hereinafter in this Section 4 provided, if any list of prices filed with the secretary by any member of the code pursuant to this Schedule E and at the time in effect shall show a specified rate of reduction from the price of any product to be allowed by such member on any sale of such product to any jobber for resale, such member may, from and after the date on which such list shall have become effective, allow to any jobber to whom such member shall sell such product for resale a deduction from such price to such jobber for such product at a rate not greater than the rate so shown in such list; and provided, further, that the board of directors by the affirmative vote of three-fourths of the whole board may permit any member of the code in special instances or members of the code generally to sell or contract for the sale of any product produced by such member or members at a base price which shall be less than the then published base price of such member or members for such product at the respective basing points therefor of such members, if by such vote such board shall determine that the making of such sale or contract of sale at much less base price is in the interest of the industry or of any other branch of industry and will not tend to defeat the policy of Title I of the National Industrial Recovery Act by making possible the using or employing of an unfair practice. The board of directors shall prescribe such rules and regulations as it shall deem proper by which the question of whether or not any purchaser or prospective purchaser of any product for resale is a jobber shall be determined, and in granting any permission as aforesaid, the board of directors shall prescribe such rules and regulations in respect thereof as in its judgment shall be necessary in order to insure to the members of the code that action in accordance with any such permission shall not result in an unfair practice; and thereafter such board may by like vote rescind any permission so granted or modify, cancel or add to any rules and regulations so prescribed. The secretary shall send to each member of the code a copy of all such rules and regulations prescribed by such board with respect to the determination of the question of whether a purchaser or prospective purchaser for resale is a jobber and he shall give notice in writing of all action so taken by the board of directors to each member of the code which at the time shall be engaged in producing the kind of product in respect of which any such permission was granted. Before any member of the code shall allow any such deduction to any jobber or sell for resale to any purchaser who shall not be a jobber any product pursuant to any permission so granted to such member, such member shall secure from such jobber or such other purchaser an agreement substantially in a form theretofore approved by the board of directors and filed with the secretary whereby such jobber or other purchaser shall agree with such member (a) that such jobber or other purchaser will not, without the approval of the board of directors, sell such product to any third party at a price which at the time of the sale thereof shall be less than the price at which such member might at that time sell such product to such third party, and (b) that, if such jobber or such other purchaser shall violate any such agreement, he shall pay to the treasurer as an individual and not as treasurer of the institute, in trust, as and for liquidated damages the sum of $10 per ton of any product sold by such jobber or such other purchaser in violation thereof. Except as aforesaid, all prices quoted and billed by any member of the code for standard Tee rails of more than 60 pounds per yard, angle bars and rail joints sold by it from and after ten days after the effective date of the code (disregarding extras and deductions as aforesaid) shall be not less than the published base price of such member for such rails, angle bars and rail joints effective at the time of the sale thereof f.o.b. mill of the producer, or, in the case of rails, angle bars or rail joints carried by water from any Atlantic Coast or Gulf port to any Gulf or Pacific coast port, c.i.f. the port of destination. Except as aforesaid, all prices quoted and billed by any member of the code for oil country tubular goods sold by it from and after ten days after the effective date of the code (disegarding extras and deductions as aforesaid) shall be not less than the delivered price for such goods determined by deducting from the published list price of such member for such goods effective at the time of the sale thereof the published basing discounts applicable to such goods effective at such time. In case at the effective date of the code any valid, firm contract to which a member of the code shall be a party shall exist for a definite quantity of any product or for all or a substantial part of the requirements of the purchaser thereof (a) at a fixed price, or (b) at a price that can be definitely determined in accordance with the provisions of such contract, or (c) at the market price for such product at the date when a definite quantity thereof shall be specified under such contract and such contract covered a sale of 20% or more of the total quantity of such product produced and sold in the United States in the calendar year 1932, it is recognized that such contract will tend to establish the market price for such product during the remainder of its life and that, if the other members of the code which produce and sell such product shall by the foregoing provisions of this Schedule E be prevented from selling such product during the remainder of the life of such contract at as favorable a price and on as favorable terms and conditions as those provided for in such contract, then unfair competition as between the member of the code which shall be a party to such contract and its competitors may result. Accordingly, anything herein to the contrary notwithstanding, during the remainder of the life of such contract any member of the code may sell such product at a price and on terms and conditions as favorable as (but not more favorable than) the price, terms and conditions provided for in such contract.

Some slight changes in the wording of the original draft of Section 4 have been made—EDITOR'S NOTE.

SECTION 5—The board of directors shall have power on its own initiative, or on the complaint of any member of the code, to investigate any base price for any product at any basing point shown in any list filed with the secretary by any member of the code, and for the purpose of the investigation thereof to require such member to furnish such information concerning the cost of manufacturing such product as the board of directors shall deem necessary or proper for such purpose. If the board of directors after such investigation shall determine that such base price is an unfair base price for such product at such basing point, having regard to the cost of manufacturing such product, and that the maintenance of such unfair base price may result in unfair competition in the industry, the board of directors may require the member of the code that filed the list in

which such unfair base price is shown to file a new list showing a fair base price for such product at such basing point, which fair base price shall become effective immediately upon the filing of such list. If such member of the code shall not within ten days after notice to it of such determination by the board of directors file a new list showing such fair base price for such product at such basing point, the board of directors shall have power to fix a fair base price for such product at such basing point, which fair base price, however, shall not be more than the base price of any other member of the code at that time effective for such product at such basing point and in respect of which the board of directors shall not therefore have begun an investigation or a complaint shall not have been made by any member of the code. When the decision of such board fixing such fair base price shall have been filed with the secretary and the secretary shall have given notice thereof to such member, such fair base price shall be the base price of such member for such product at such basing point, until it shall have been changed as in the code provided. A notice of all decisions of the board of directors until this Section 5, together with the reasons therefor, shall be filed with the President.

SECTION 6—The board of directors by the affirmative vote of a majority of the whole board may establish maximum rates of discount and maximum periods of free credit, other than those specified in Schedule G of the code, which may be allowed by any member of the code with respect to the sale of any product or products to jobbers for resale as permitted by the provisions of Section 4 of this Schedule E. The secretary shall give notice in writing of any action taken by the board of directors in accordance with the provisions of this Section 6 to each member of the code which at the time shall be engaged in producing the kind of product in the sale of which any such other rates or periods shall have been established by such action. Except as aforesaid and except as elsewhere in this Schedule E of the code otherwise provided, the maximum rates of discount for early payment and the maximum periods of free credit which may be allowed by any member of the code shall be the rates and periods specified in said Schedule G. Except as aforesaid, all invoices for products sold by any member of the code after the effective date of the code shall bear interest from and after the expiration of the period of free credit at a rate which shall not be less than the then current rate established by the board of directors and filed with the secretary. Nothing in the code contained shall prevent any member of the code from allowing credit to any purchaser or allowing any purchaser to delay payment in respect of any invoice for a longer period than the maximum period of free credit specified in such Schedule G or such other maximum period as shall be established in accordance with the provisions of this Section 6; but, if any member of the code shall allow credit to any purchaser or allow any purchaser to delay payment of any invoice for a period longer than such maximum period of free credit, then such member shall charge and collect interest on the amount in respect of which credit shall be so allowed or the payment of which shall have been so delayed at a rate not less than the current rate established and filed as aforesaid.

Section 6 has been reworded considerably. We suggest interested readers compare old and new text carefully.—EDITOR'S NOTE.

SECTION 7—Except as in this Schedule E of the code otherwise provided, any extras added to, and any deductions made from, the base price for any product sold by any member of the code in determining its quoted or billed price for such product shall be uniform for all members of the code. The rates of such extras and of such deductions shall be those approved from time to time by the board of directors as being in accordance with the trade practice customary in the industry at the effective date of the code and as meeting the requirements of the code. **Lists showing such rates shall be filed with the secretary and shall be open to inspection at all reasonable times by anyone.** In case any member of the code shall sell any product to which any such rate of extra or deduction shall apply, except as aforesaid such member shall add an extra at a rate which shall not be less than the rate of extra applicable to such products theretofore approved by the board of directors as aforesaid and at the time in effect and none of the members of the code shall make any deduction at a rate that shall be more favorable to the purchaser of such product than the rate of deduction applicable to such product theretofore approved by the board of directors as aforesaid and at the time in effect; provided, however, that nothing in the code contained shall be so construed as to prevent any member of the code from selling or contracting to sell any product for use by the purchaser thereof in the manufacture of articles for shipment in export trade within the meaning of the term "export trade" as it is used in the Export Trade Act under an agreement by such member of the code with such purchaser that, when such articles shall have been shipped in such export trade, such member of the code shall make an allowance at a rate approved by the board of directors and a statement of the approval of which shall theretofore have been filed with the secretary, which rate in the opinion of such board shall be sufficient to enable such member of the code or such purchaser to meet foreign competition in the sale and delivery of such product or such articles, as the case may be.

SECTION 8—The practice of shipping products of consignment may result in unfair competition and it is the intention of the industry to eliminate such practice as soon as possible after the effective date of the code. Accordingly, except to the extent necessary to carry out arrangements existing on the effective date of the code and which shall have been reported to the board of directors, from and after such date none of the members of the code shall deliver products, other than pipe, on consignment except to an affiliated company of such member. All arrangements for the delivery by any member of the code of products on consignment (other than consignments to an affiliated company of such member and other than consignments of pipe) existing on the effective date of the code shall be terminated on or before June 30, 1934, and all stock held on consignment on that date shall either be sold to the consignee or possession thereof shall be taken by the consignor. The board of directors shall investigate problems presented in the elimination of consigned stocks of pipe and shall recommend to the members of the code which shall be parties to then existing arrangements with respect to shipments of pipe on consignment (other than consignments from a member of the code to an affiliated company) such action in respect thereof as such board shall deem proper and designed to accomplish the termination of all such arrangements (other than as aforesaid) at an early a date as possible.

SECTION 9—For all purposes of this Schedule E, a delivery of any product made pursuant to a contract of sale shall be regarded as a sale thereof made at the time of the making of such contract. Except in the case of a product required by a purchaser for a specified definite contract of such purchaser with a third party at a fixed price, none of the members of the code shall make any contract of sale of any product by the terms of which the shipment of such product is not required to be completed before the end of the calendar quarter-year ending not more than four months after the date of making of such contract.

SECTION 10—Nothing in the code contained, however, shall be so construed as to prevent the per-

formance by any member of the code of a valid, firm contract existing and to which it is a party at the effective date of the code for a definite quantity of any produce or for all or a substantial part of the requirements of the purchaser thereof (a) at a fixed price, or (b) at a price that can be definitely determined in accordance with the provisions of such contract, or (c) at the market price for such product at the date when a definite quantity thereof shall be specified under such contract. If any member of the code shall at the effective date thereof be a party to any contract for the sale of any product by such member which by its terms is to continue after December 31, 1933, and by its terms the price to be paid for such product by the other party to such contract is related to the market price thereof at the date when a definite quantity thereof may be specified under such contract and may be less than such market price, then such member shall within 30 days after the effective date of the code file a copy of such contract with the secretary in order that the board of directors may consider it and take such action in respect thereof consistent with the rights and obligations of the parties to such contract as such board shall deem proper.

SECTION 11—A sale made by any member of the code indirectly through any affiliated company of such member shall be deemed to be a sale by such member.

SECTION 12—Nothing in the code contained shall be deemed to apply to or affect the sale of any product for direct shipment in export trade by any member of the code within the meaning of the term "export trade" as it is used in the Export Trade Act or, unless and to the extent that the board of directors shall otherwise determine, the sale of any product by any such member for direct shipment to the Philippines, Hawaii or Porto Rico or other insular possessions of the United States of America.

Section 13—If and to the extent requested by the Administrator, all decisions of, permissions and approvals given by and rules and regulations made by the board of directors pursuant to any provision of this Schedule E shall be reported to him.

Schedule F

Five new products have been added in the final code, namely, "axles, rolled or forged; ingots, blooms, billets and slabs—alloy; pig iron—low phosphorus; tubes—boiler; and wheels—car, rolled steel." One product—"railroad angle bars"—has been dropped. "Light rails—less than 60 pounds per yard" has been changed to "Light rails—60 pounds or less per yard."

Jackson, O., has been added to the list of basing points for "pig iron—foundry, malleable, open hearth basic and bessemer."

Under "railroad tie plates" and railroad track spikes," Minnequa, Colo., has been substituted for Pueblo, Colo.

Waukegan, Ill., has been added to the list of basing points under "wire—telephone."

—EDITOR'S NOTE

List of Basing Points

The places hereinafter in this Schedule F listed are the basing points for the respective products named.

AXLES—ROLLED OR FORGED:

Pittsburgh	Birmingham
Chicago	

BALE TIES:

Pittsburgh	Duluth
Cleveland	Gulf Ports*
Chicago	Pacific Coast
Birmingham	Ports**

BARS—ALLOY STEEL, HOT ROLLED:

Pittsburgh	Canton, O.
Buffalo	Massillon, O.
Chicago	Bethlehem, Pa.

BARS—COLD FINISHED, CARBON AND ALLOY:

Pittsburgh	Chicago
Buffalo	Gary, Ind.
Cleveland	

BARS—CONCRETE REINFORCING:

Pittsburgh	Birmingham
Buffalo	Youngstown
Cleveland	Gulf Ports
Chicago	Pacific Coast Ports
Gary, Ind.	

BARS—IRON:

Pittsburgh	Reading, Pa.
Troy, N. Y.	Danville, Pa.
Dover, N. J.	Burnham, Pa.
Jersey City, N. J.	Creighton, Pa.
Philadelphia	Richmond, Va.
Columbia, Pa.	Louisville, Ky.
Lebanon, Pa.	Terre Haute, Ind.

BARS—MERCHANT STEEL:

Pittsburgh	Birmingham
Buffalo	Gulf Ports
Cleveland	Pacific Coast
Chicago	Ports**
Gary, Ind.	

BARS—TOOL STEEL:

Pittsburgh	Bethlehem, Pa.
Syracuse, N. Y.	

GIRDER RAILS:

Lorain, O.	Steelton, Pa.

INGOTS, BLOOMS, BILLETS AND SLABS—ALLOY:

Pittsburgh	Canton, O.
Buffalo	Massillon, O.
Chicago	Bethlehem, Pa.

INGOTS, BLOOMS, BILLETS AND SLABS—CARBON:

Pittsburgh	Gary, Ind.
Buffalo	Birmingham
Cleveland	Youngstown
Chicago	

LIGHT RAILS—60 LBS. OR LESS PER YARD:

Pittsburgh	Birmingham
Chicago	

MECHANICAL TUBING:

Pittsburgh	Detroit
Canton, O.	Milwaukee
Shelby, O.	

PIG IRON—FOUNDRY, MALLEABLE, OPEN HEARTH BASIC AND BESSEMER:

Buffalo	Jackson, O.
Cleveland	Toledo, O.
Chicago	Granite City, Ill.
Birmingham	Detroit
Youngstown	Duluth, Minn. (except open hearth basic)
Neville Is., Pa.	
Sharpsville, Pa.	
Erie, Pa.	Provo, Utah
Bethlehem, Pa.	Everett, Mass.
Swedeland, Pa.	Sparrows Point, Md.
Birdsboro, Pa.	
Hamilton, O.	

PIG IRON—LOW PHOSPHORUS:

Birdsboro, Pa.	Johnson City, Tenn.
Steelton, Pa.	
Standish, N. Y.	

PIPE—RIGID ELECTRICAL CONDUIT:

Pittsburgh	Evanston, Ill.

PIPE—STANDARD, LINE PIPE AND OIL COUNTRY TUBULAR PRODUCTS:

Pittsburgh	Lorain, O.
Gary, Ind.	

PLATES:

Pittsburgh	Sparrows Point, Md.
Chicago	
Gary, Ind.	Gulf Ports
Birmingham	Pacific Coast Ports
Coatesville, Pa.	

RAILROAD TIE PLATES:

Pittsburgh	Minnequa, Colo.
Buffalo	Weirton, W. Va.
Chicago	Portsmouth, O.
Birmingham	Steelton, Pa.
St. Louis	Pacific Coast Ports
Kansas City, Mo.	

RAILROAD TRACK SPIKES:

Pittsburgh	Kansas City, Mo.
Buffalo	Minnequa, Colo.
Cleveland	Philadelphia
Chicago	Lebanon, Pa.
Birmingham	Columbia, Pa.
Youngstown	Richmond, Va.
Portsmouth, O.	Jersey City, N. J.
Weirton, W. Va.	Pacific Coast Ports
St. Louis	

SHEET BARS:

Pittsburgh	Youngstown
Buffalo	Canton, O.
Cleveland	Sparrows Point, Md.
Chicago	

SHEETS:

Pittsburgh	Birmingham
Gary, Ind.	Pacific Coast Ports

SKELP:

Pittsburgh	Coatesville, Pa.
Buffalo	Sparrows Point, Md.
Chicago	
Youngstown	

STEEL SHEET PILING:

Pittsburgh	Gulf Ports
Buffalo	Pacific Coast Ports
Chicago	

STRIP STEEL—COLD-ROLLED

Pittsburgh	Worcester, Mass.
Cleveland	

STRIP STEEL—HOT-ROLLED:

Pittsburgh	Chicago

STRUCTURAL SHAPES:

Pittsburgh	only)
Buffalo	Bethlehem, Pa.
Chicago	Gulf Ports
Birmingham	Pacific Coast Ports
(standard shapes	

(*Please turn to Page* 69)

*Except as otherwise shown in this Schedule F, the Gulf Ports are Mobile, Ala.; New Orleans, La.; and Orange, Port Arthur, Beaumont, Baytown, Galveston and Houston, Tex.

**The Pacific Coast ports are San Pedro (including Wilmington) and San Francisco (including Oakland), Calif.; Portland, Oreg.; and Seattle (including Tacoma), Washington: and San Diego, Calif., for Plates and Shapes only.

Industrial Men in the Day's News

Guilliam H. Clamer, Seaman Medalist of the American Foundrymen's Association

FOR nearly two decades has he been actively associated with the metals casting industry.

HE was one of the first to stress chemistry. His company has developed many types of furnaces for nonferrous metals.

IN every society and association identified with the foundry he has been active, being a past president of the A. F. A.

FOR outstanding achievements in the metal castings industry, the Joseph S. Seaman Gold Medal of the American Foundrymen's association was presented to Guilliam H. Clamer at the association's recent convention in Chicago. A few days prior an honorary degree of doctor of science was conferred on him by Ursinus college, Collegeville, Pa.

Mr. Clamer has been associated with the advancement of metal casting for nearly 40 years. Under his direction many valuable improvements in melting and casting practice have been developed. He is a past president of the American Foundrymen's association and a life member of the advisory board.

Born in Philadelphia, June 9, 1875, Mr. Clamer attended public school there and received his technical training first in the city manual training school and later at the University of Pennsylvania. Further early training was received in the laboratory of Dr. F. A. Genth, a noted mineral chemist.

On graduating from the university in 1897 with a B.S. degree in chemistry, Mr. Clamer established a chemical laboratory at the Ajax Metal Co., Philadelphia, with which he has been associated ever since. This was one of the first, if not the first, times a chemist had been regularly employed in the nonferrous foundry industry.

In improving upon methods of employing scrap metals, Mr. Clamer's experiments led to invention of a refining process in 1901 for which he received the Elliot Cresson Gold Medal of the Franklin institute. Still later, under his direction, his company developed several improved types of furnaces for nonferrous metal melting, especially electric induction furnaces. He also is president and general manager of the Ajax Electric Furnace Corp., Ajax Electrothermic Corp. and Ajax Electric Co. Inc.

Long active in association work, Mr. Clamer was the first nonferrous member of the American Society for Testing Materials, and is a past president.

He is a past-president of the American Institute of Metals and of the mining and metallurgical section of Franklin institute; member board of managers, Franklin institute, and chairman, committee on science and the arts; charter member American Electrochemical society.

He also is a member of the American Institute of Mining and Metallurgical Engineers, American Society for Steel Treating, American Institute of Electrical Engineers; member of the nonferrous technical advisory committee of the bureau of standards for nearly 20 years; member British Iron and Steel institute, and one of original American members of the British Institute of Metals.

Mr. Clamer was the American Foundrymen's association appointee to represent the nonferrous foundry industry in contacting on technical matter with the United States government in the World war. He also was vice president of the war service association of manufacturers of solder and babbitt metal.

E. J. MURRAY has been appointed Chicago district sales manager for the Highland Iron & Steel Co., Terre Haute, Ind., subsidiary of the American Chain Co., Bridgeport, Conn. He succeeds W. C. Wolfe who recently was made vice president in charge of sales of the Reading Iron Co., Philadelphia. Mr. Murray has been identified directly with the Highland company for the past 20 years and with the iron and steel industry for more than 30 years. His first selling experience was with the Cleveland Steel Co., since absorbed by the Otis Steel Co. Later he was associated with a Chicago brokerage company representing the old La Belle Iron Works and the Highland Iron & Steel Co. In 1907 Mr. Murray became assistant western manager of sales for the La Belle company when it opened its Chicago office, later going to San Francisco where he assisted in opening and developing a Pacific coast office for that company. Returning to Chicago in 1913 to join the Highland Iron &

(*Please turn to Page* 63)

EDITORIAL

Steel Code Acceptance Is Vindication for Industry

NOW that President Roosevelt has approved the steel code, it is possible to view the events of the past nine weeks in retrospect and to appraise accurately the action of the iron and steel industry during that trying period.

The national industrial recovery act was approved by the President on June 16. Before the ink had dried on his signature the steel industry was well on its way toward the preparation of a code. Committees worked night and day in working out a pact which not only would meet the letter and spirit of NIRA but also would serve as an agency for eliminating certain well known evil practices from the industry.

On July 14 a code meeting these exacting requirements was filed with the recovery administrator, who later scheduled a hearing for July 31. On the appointed day the industry formally presented its code, testimony for and against its provisions was heard, and opportunity was granted for the filing of additional briefs. The hearing adjourned after discussion lasting only six hours.

Two weeks elapsed, during which time NRA officials reviewed the code, testimony and briefs. On Tuesday, Aug. 15, representatives of the steel industry met with government officials; negotiations continued intermittently for four days. In the early hours of Saturday, Aug. 19, agreement was reached, and on the evening of the same day the President issued an executive order approving the code.

Approval of Code with Slight Modifications Proves Attacks on Industry Unwarranted

During the 64 days from the date NIRA was approved until the code was approved, the iron and steel industry was under almost continuous fire from critics who charged that the industry was not doing its part in co-operating with the government. The abuse heaped upon the head of steel ranged all the way from hints that it was sabotaging NIRA to hysterical charges that it was "trampling on the American flag" and affronting the government itself.

Because of this constant barrage of high-powered expletives, one would have thought that the steel industry's code was highly objectionable to the government—and that it would require drastic revision before it could meet with the approval of the President.

In view of all this, the acceptance of the code with relatively minor changes is a gratifying vindication of the industry's sincerity of purpose. The fact that the final text corresponds so closely in substance to that originally submitted is clear-cut evidence that from the very beginning the industry knew what it was doing and did its job well. It proves that steel devoloped on short notice a pact so harmoniously tuned to the intent and spirit of NIRA and so accurately co-ordinated to the industry's capacity to co-operate with the government, that the most diligent critics among representatives of NRA, labor and consumers could find no warrant for changing it except in minor detail.

Organization, Co-operation and Leadership Are Factors in Steel's Achievement

This achievement should be gratifying to everyone identified with the iron and steel industry. It was made possible by a number of factors, all of which reflect creditably upon the latent ability of the industry to rise to an emergency.

First is organization. The American Iron and Steel institute is not a trade association in the ordinary sense. It is a loosely organized body. Yet in the present emergency it has proved to be an invaluable agency for concentrating the full force of the industry upon a single objective.

Second is solidarity of purpose. Not all companies are equally enthusiastic over all provisions of the code. It will bear unevenly on the various members. Yet, in spite of inequalities, all companies, with few exceptions, submerged their individual interests in order that the industry could present its case with a united front. This attitude is all the more remarkable when it is contrasted with the conflicting opinions expressed by factions of the coal and oil industries in the presentation of their codes.

Third is leadership, a quality which has developed in the crucible of the present experience. As hopefully predicted in this column in the issue of July 31, the ordeal of the code negotiations has brought forth a new leadership, which will mean much to the industry in the trying period ahead.

The steel industry is passing through a difficult period. That it has met the first test without faltering is a noteworthy tribute to its fundamental strength and soundness.

THE INDUSTRIAL DIAL

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The Business Trend Section of STEEL
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AUGUST has been marked by a break in the upward trend of business, caused partly by seasonal influences and to an undetermined extent by uncertainties in connection with NRA.

While the easing in the mad pace of industrial activity was apparent in steelworks operations before the end of July, no clear-cut measure of its effect upon industry generally was available until mid August. Then it became evident that the recessions were not abnormally severe, in view of the season, and that there were mitigating circumstances which made it difficult to compare this midsummer dull period with similar seasonal slumps of previous years.

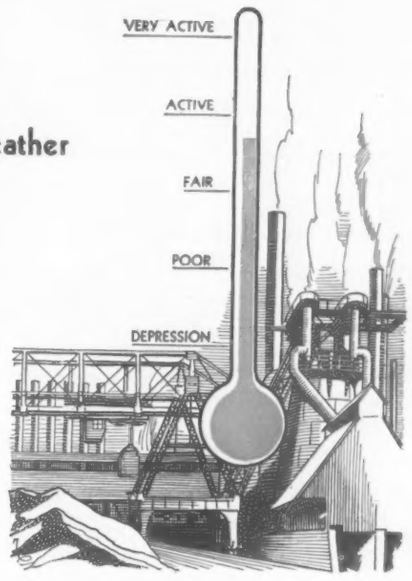
For instance, the slippage in the rate of steelmaking and the decline in unfilled bookings of U. S. Steel as of July 31 were influenced by price uncertainties which prompted many buyers to ask for prompt deliveries and thus disturbed the normal flow of specifications.

In the automobile industry, while schedules have been cut considerably from July levels, activity in August has been maintained at a higher rate relatively than in this off-season in previous years. Car loadings and electric power output, while receding moderately from July peaks, have successfully resisted seasonal pressure and throughout the month have fluctuated within narrow ranges.

In general, the easing of activity has not of itself disturbed business sentiment. Such uneasiness as has manifested itself has been caused by doubts induced by the varying fortunes of NRA and by the lurking element of danger in the government's undetermined policy in regard to the future value of the dollar.

While the blanket code was being promoted with the aid of implied boycott and while industrial codes were awaiting NRA decisions, industry found itself unable to contract into the future. Costs were too uncertain and the danger of the

Industrial Weather



TREND:

Mid-Summer Uncertainty

The Barometer of Business

Industrial Indicators

	July, 1933	June, 1933	July, 1932
Pig iron output (Daily average, tons)	58,108	42,165	18,394
Machine Tool Index	40.4	27.9	33.8
Unfilled orders (tons)	2,020,125	2,106,671	1,966,302
Ingot output (Daily average, tons)	128,152	99,904	32,269
Dodge Bldg. awards in 37 states (sq. ft.)	14,605,600	16,199,500	14,399,000
Automobile output	.....	260,645	116,615
Coal output, tons	29,457,000	25,320,000	17,857,000
Business failures, number	1,421	1,648	2,596
Business failures, liabilities	$27,481,103	$35,344,909	$87,189,639
Cement production, Bbls.	.....	7,804,000	7,659,000
Cotton consumption, bales	600,143	696,472	279,000
Car loadings (weekly av.)	621,763	566,345	524,000

Foreign Trade

	July, 1933	June, 1933	July, 1932
Exports	$145,000,000	$119,900,000	$106,830,000
Imports	$143,000,000	$122,000,000	$79,421,000
Gold exports	$85,375,000	$4,380,000	$23,474,000
Gold imports	$1,496,000	$1,136,000	$20,037,000

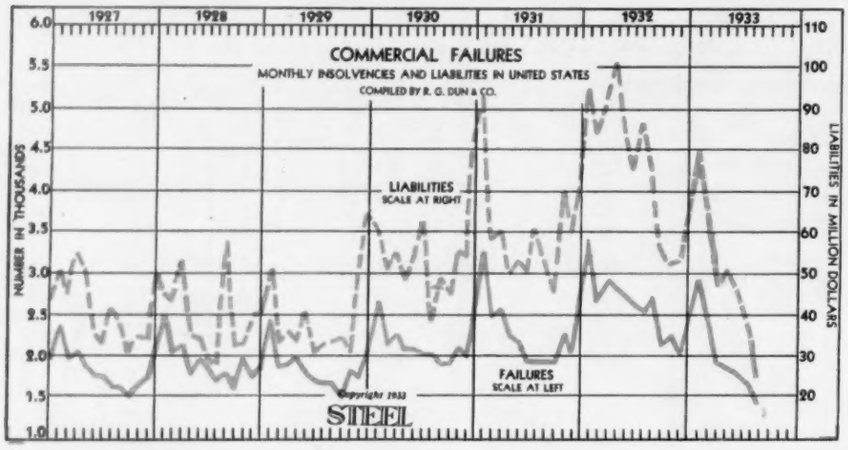
Financial Indicators

	July, 1933	June, 1933	July, 1932
25 Industrial stocks	$135.84	$134.53	$63.41
25 Rail stocks	$41.09	$36.01	$11.88
40 Bonds	$77.53	$73.45	$57.90
Bank clearings (000 omitted)	21,428,987	$19,710,228	$19,049,639
Commercial paper rate N. Y. (per cent)	1¾	1¾–2	2½
*Commercial loans (000 omitted)	$4,772,000	$4,704,000	$6,405,000
Federal Reserve ratio, per cent	68.5	68.8	56.5
Railroad earnings	$59,453,185	$40,693,072	$12,299,666
Stock sales, N. Y. stock exchange	120,300,463	125,627,124	23,055,724
Bond sales, par value	$384,014,300	$377,745,900	$243,637,550

*Leading member banks Federal Reserve System.
**June, July and June, respectively.

Commodity Prices

	July, 1933	June, 1933	July, 1932	Monthly Av. 1913
STEEL's composite average of 14 iron and steel prices	$29.81	$28.73	$29.47	$26.32
Bradstreet's index	$9.00	$8.33	$6.79	$9.21
Wheat, cash (bushel)	$1.18	$1.04	62c	92c
Corn, cash (bushel)	73c	63c	49c	51c
Petroleum, crude (Bbl.)	.....	.....	90c	$2.50



Number

July, 1933	1,421
June, 1933	1,648
July, 1932	2,596

Liabilities

July, 1933	$27,481,103
June, 1933	35,344,909
July, 1932	87,189,639

dancing dollar was another serious complication.

Approval of the steel code with minor changes, the settlement of several other codes for basic industries, and the recent easing of some of the more flagrant inequalities in the blanket code promise to partially allay fears occasioned by these measures. Appearance of a number of large public works projects and the imminence of the fall upturn also are tending to quiet distracted nerves.

Barring unforeseen events, business seems to be headed for a moderate improvement in September, with a probable increase in the tempo into October.

Where Business Stands

Monthly Average, 1932 — 100

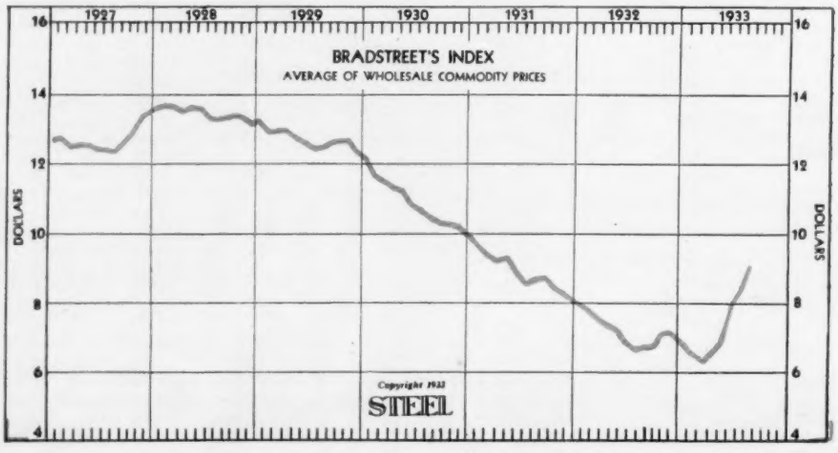
	July, 1933	June, 1933	July, 1932
Steel Ingot Output	305.3	238.0	76.9
Pig Iron Output	245.2	177.4	77.6
Freight Movement	114.4	104.3	89.1
Building Construction	107.7	123.1	107.6
Automobile Output	.....	218.5	97.7
Wholesale Prices	126.8	117.3	95.6

July Business Failures Lowest in Ten Years; Liabilities Down

Commercial failures in the United States during July declined to the lowest level for any month in the past ten years. According to Dun & Bradstreet Inc., there were 1,421 insolvencies during July compared with 1,648 in June, and 2,596 in July last year. To find a lower record for the seventh month it is necessary to go back to the 1,231 defaults in July, 1923. Liabilities in July were $27,481,103 which compares with $35,344,909 for June and $87,189,639 for July, 1932.

Commodity Price Index Gains 41.8 Per Cent Since March 1

Despite the recession of some of the more speculative commodities, which peaks were reached in mid-July, Bradstreets index of commodity prices showed a continuation of the upward trend. The index for August 1 stood at $9.00 a gain of 8.1 per cent over the level of $8.33 on July 1 and compares with $6.95 on August 1 last year. This is the fifth successive monthly increase since March 1—when the index declined to $6.35—making a total gain during the five-month period of 41.8 per cent.



	1933	1932
August 1	$9.00	$6.95
July 1	8.33	6.68
June 1	8.02	6.92
May 1	6.98	7.15

WELDING ROLLED STEEL DIESEL ENGINE STRUCTURES

Part I

BY EVERETT CHAPMAN
Lukenweld Inc.

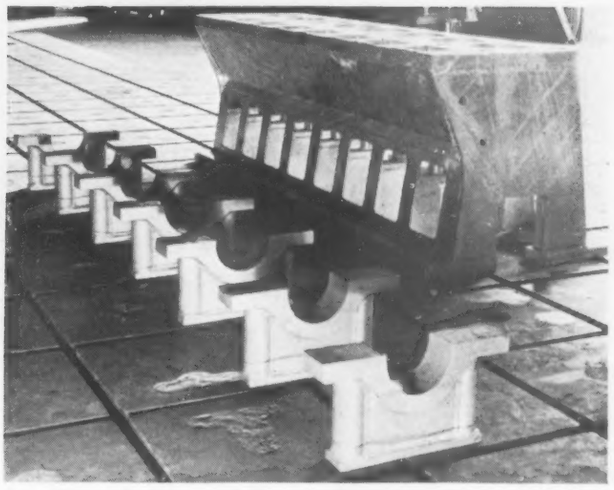


Fig. 1—An early type of welded diesel marine engine crankcase

EXCESSIVE weight has prevented the diesel engine from assuming importance as a prime mover in transportation units. The transportation field, both marine and railway, has been closed to the diesel engine because of its usual specific weight ratio ranging from 40 to 250 pounds per horsepower. Many successful applications have been made in marine and railroad yard service, but these have included only the most probable ones. The possible and likely applications, such as railroad main line passenger and freight service, have been untouched.

Much of the weight involved in a diesel engine is intimately connected with that part of the structure—the crankcase—which functions to connect the main gas load with its reaction point, the main bearings. The combination of high combustion pressures and large piston diameters results in loads of large magnitude. The strict requirement of structural rigidity, coupled with the fatigue nature of the load, demand that the usual cast material be worked at low stresses, which results in the excessive weight figures constituting usual practice today.

The tension nature of the load, imposed on a material that is not well suited to tension loading, results in a composite structure consisting of steel tie rods connecting the main bearings with the cylinder heads. These rods are in turn surrounded by a cast-iron structure which supplies the necessary rigidity for minimizing vertical deflection due to the gas loads and the horizontal components resulting from the inertia loading of the crankpins and rods.

The first step in reducing the weight of the

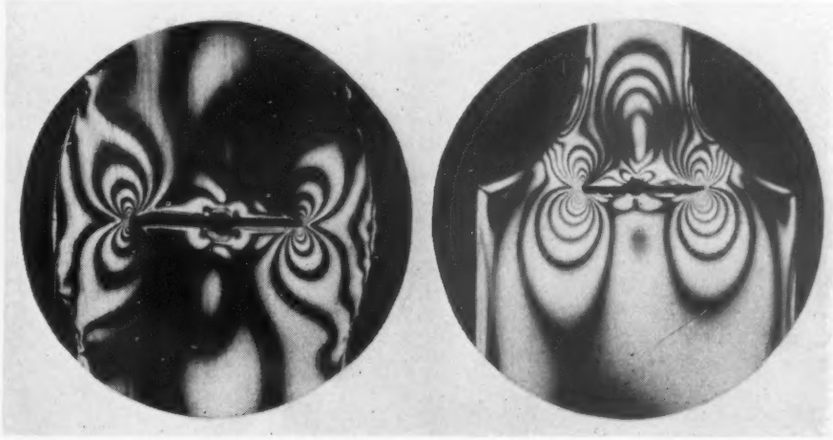


Fig. 2—Photoelastic studies of two common types of superficial welded joints. These stress concentrations cause early failure in a structure subjected to repeated loading

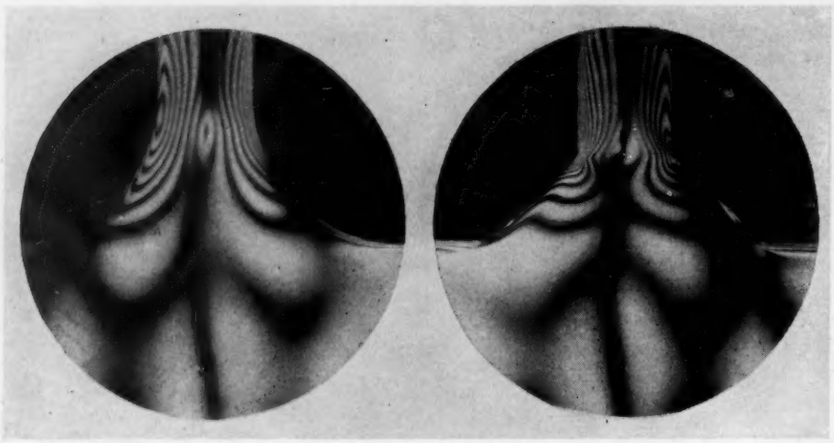


Fig. 3—Photoelastic studies contrasting stress distribution around a concave weld fillet with distribution around a weld fillet with a triangular cross section

usual arrangement naturally contemplates the use of steel as the structural material. Steel, with a modulus of elasticity of 30,000,000 in contrast to cast iron with a modulus of 12,000,000, can provide a structure of similar section working at the same stress as the old one, but with only 40 per cent of the deflection. Putting this another way, it means that the steel structure can be worked at two and one half times the stress of the cast-iron structure, and yet retain the same rigidity. Care must be taken in the application of this figure in design work, since only those areas which are axially loaded can be reduced by any such amount. In the re-design of members subjected to bending, it is the moment of inertia of the section that is reduced by 40 per cent, and this new value is used in the re-design of the section.

Endurance Limit Higher

The other physical characteristic of steel which enables a lighter-weight construction is its higher endurance limit as a fatigue-resisting material. Steel's higher ultimate strength is not a controlling factor since the engine must not break. Its higher yield point is of no advantage because the structure is useless if a permanent set occurs. Its superior ductility is important only as an index to the cleanliness of the steel. Therefore, it is obvious that the modulus of elasticity and endurance limit of steel are the only two factors which permit reduction in weight of a diesel crankcase.

Many attempts, some successful, have been made to execute the lightweight diesel crankcase in cast steel, but here again is an inhibiting factor in that cast steel will not flow in sections as thin as cast iron. Thus, limitations of the manufacturing method legislate against any appreciable weight reduction.

An alternative, then, is use of rolled steel in the form of plates and shapes to build up the desired structure. To join the components, riveting is out of the question because the nonhomogeneous and semirigid joints will not stand up under the severe service of the diesel type of loading. In contrast, welding is eminently suited as the method of fabricating the rolled steel crankcase.

Questions asked on the application of welding center about two prime requisites, stiffness and endurance life, plus a secondary factor—corrosion-resistance—which affects only those marine installations where salt water is used as a cooling medium.

Questions concerning structural rigidity are answered by the fact that steel is the stiffest commercial material known. Further, flexibility of the welding process enables the designer to use economical, efficient sections. Thus, the matter of requisite rigidity is controlled entirely by the designing department. When the structural constants are handled properly, the designer can achieve a structure of either equal stiffness and lighter weight than the old design, or obtain a structure of higher rigidity at the same weight.

The problem of endurance life can be stated rather simply although the subject as a whole is somewhat involved. In handling the severe loading conditions encountered in diesel engine work over an equitable period of time, it is necessary to study thoroughly the mechanism of fatigue failure. The essence of the matter is that the stress range through which the component materials can be repeatedly stressed indefinitely without causing failure must be known. The maximum stress in the structure, wherever it occurs, must be under the known safe value.

A low average stress as usually calculated cannot possibly guarantee an indefinite service life—it is the maximum stress which governs. A point of maximum stress may lurk in a hidden corner with too sharp a radius; it may exist in the bottoms of small tool marks; it may be present at undercuts unconsciously made during the welding process; or it may be found at any small blow-holes or porosity in the materials. In particular, in the welding process, points of maximum

THROUGH the utilization of welded steel structures, the specific weight ratios of diesel engines have been reduced from 40 to 250 pounds per horsepower to 10 pounds per horsepower, thereby making these units suitable for transportation applications. The accompanying article, the first of two, considers preliminary design; Part II, to be presented shortly, will describe the construction of a 1000-horsepower twin-six engine. These articles constitute a paper presented in Atlantic City, N. J., Aug. 23, before the Oil and Gas Power division of the American Society of Mechanical Engineers. The author is vice president in charge of engineering, Lukenweld Inc., division of Lukens Steel Co., Coatesville, Pa.

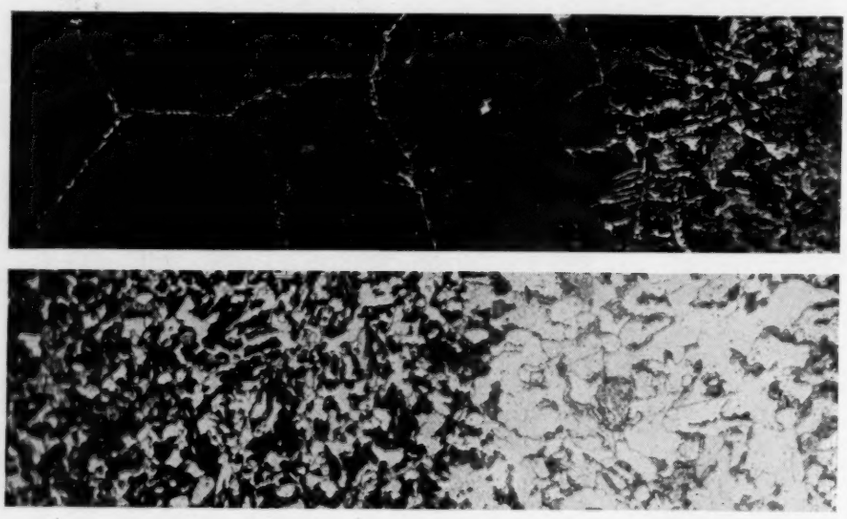


Fig. 4 (Above)—Photomicrograph at 100 diameters showing large grain size at transition zone between weld and base metal. Fig. 5 (Below)—After welding is completed, the grain structure is refined by heat treatment as shown here

stress always exist around an improperly designed welded joint. In an otherwise perfect design satisfying the rigidity requirements for successful functioning of the engine, the only thing that will break the structure subjected to repeated load is the existence of a hidden, minute defect in contour which multiplies the average stress condition by a factor of 5, 6, or even more.

Points of high local stress are evident only as fatigue failures. Such points of high stress occur over such small areas that they have no influence on rigidity. Ductility cannot operate to alleviate a high stress condition as it does in statically-loaded structures, since this phenomenon requires a permanent deformation which is inadmissible in a crankcase that

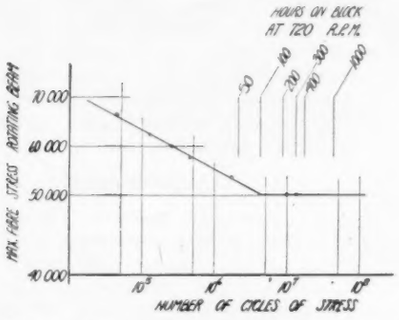


Fig. 6—Repeated stress performance of an alloy steel used in diesel crankcases of welded construction

must preserve main bearing alignment.

Fig. 6 is a diagram depicting the repeated stress performance of an alloy steel which has been found most applicable to welded steel crankcases. It is an alloy steel of low carbon content and, therefore, well suited for welding. The curve shows it to have an endurance limit as determined on a rotating-beam machine of 50,000 pounds per square inch, as contrasted with the equivalent value of 30,000 pounds for ordinary mild steel plate.

Determine Safe Stress Range

A definite limiting range of stress at which the material will function for an indefinitely large number of reversals has been proved to exist for all materials. If the engine is not to fail prematurely but is to serve indefinitely, the product of the average working stress and the stress concentration factors always introduced during fabrication must not exceed this safe stress range—50,000 pounds per square inch in this case.

Stress factors of almost any magnitude can exist in a structure. A round hole in a body of material will raise the stress in its locality by a factor of 2.7. A round hole on the surface of a material will raise the stress three times. These factors are not serious since the demands of rigidity will call for average stresses which, when multiplied by these factors, will not constitute a source of worry. The serious type of stress concentrations, against which the designer must guard, are those exemplified by sharp corners and re-entrant angles.

Mathematically, the stress concentration factor which exists at a corner or re-entrant angle is inversely proportional to the radius of curvature of the corner. If it were practically possible to achieve a perfectly sharp corner, the stress theoretically would be infinite. While it is practically impossible to machine a corner with a zero radius, there are many types of welded joints in which the radius is nearer zero than can ever be approached by machining. Concentrations of this nature cannot be tolerated.

Unsound Welds Show Up

Fig. 2 illustrates photoelastically the stress distribution around an all-too-common type of welded joint. When two plates are superficially welded together, either by two welds whose roots are not fused together or by fillet welds merely laid in the corners, there is an unwelded boundary on the interior of the joint. This crack is an integral part of the contour of the joint and has a tremendous influence on the stress distribution.

This condition can be simulated elastically by cutting from a piece of bakelite the contours of the joint, including the internal crack. This specimen, when loaded and viewed by polarized light, shows the stress distribution that would exist around a similar welded joint. The concentrations which exist in the actual welded joint are even more severe. The saw blade used to cut the internal crack has a finite width, whereas the smallest dimension of the crack in the welded joint is practically zero, due to the tremendous contracting forces exerted by the cooling weld metal.

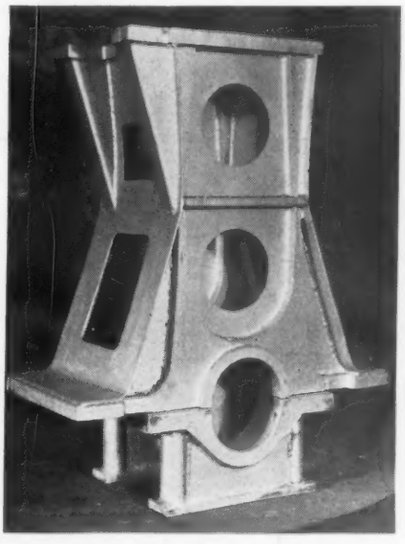


Fig. 7—A built-up single-cylinder diesel unit constructed to test efficiency of design

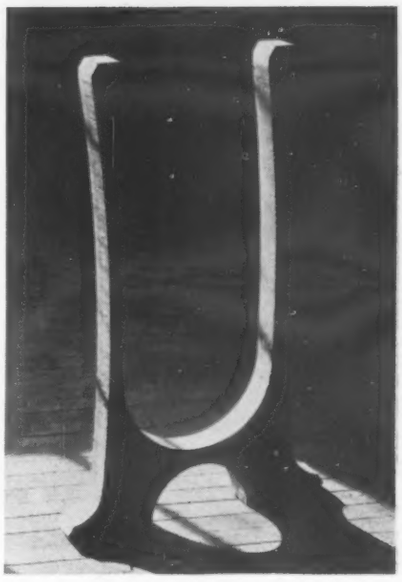


Fig. 8—The main frame of the single-cylinder unit was flame cut from a plate of 2-inch thickness

Concentrations of this nature in poorly designed welded joints have broken more welded structures than any other single cause. Such joints will function properly in statically loaded structures, since the high ductility of the weld metal can allow sufficient plastic deformation, under high load, to correct the contour. They are suicidal, however, where the structure is subjected to repeated stress.

Aim for Concave Weld Fillet

Another type of notch effect which may occur in a welded structure, and is a typical example of what a designer and fabricator must guard against, is shown in Fig. 3. It is a photoelastic study contrasting the stress distribution around a concave weld fillet with the stress distribution around a weld fillet with a triangular cross section. The triangular fillet shows marked concentrations at the ends of the weld. The concave fillet shows an evenly graduated stress, with the maximum value probably only two or three times that of the average stress. The concentration factor at the ends of the triangular weld can reach dangerous values. While the triangular-shaped weld fillet has more throat area and, therefore, a lower average stress, the maximum stress which exists is considerably higher than that around a concave fillet, although the average stress of the latter is higher because of its decreased throat.

Other points to be considered are condition of the weld, endurance value of the weld metal, and damage to the base metal by the high temperature of the welding operation. Fig. 4 shows this metallurgical damage, indicating the condition of the metal at the transition zone between the weld and the

base metal. This photograph, at 100 diameters, shows an exceedingly large grain size. Experience has shown that this enlarged grain, plus the quenching that occurs due to the cold parent metal, has the usual poor properties of the structure. It is axiom that joints never break through the weld, but always adjacent to the weld.

Fig. 5 shows how this poor condition is corrected by heat treatment of the welded structure after completion of all welding. The discontinuity in the physical properties at the fusion zone has been eliminated. Heat treatment after welding is exceedingly important, not only to correct the damage occurring during welding, but also to remove the residual stresses which are locked up in the structure. There is direct evidence that residual stresses may reach 30,000 pounds per square inch, which is nearly the yield point of ordinary material. If the structure is unfortunately loaded in the same direction as the residual stresses, there is no apparent strength.

Unannealed Structure Warps

The other important phase of stress relief is that an unannealed welded structure will warp and twist on the planer and boring mill to a degree that will render the structure useless. It will not hold its shape over any period of time. Instances have been known of unannealed welded structures which, over a period of two years, crept badly out of shape in service.

A multiplication of difficulties occurs at the edge of the weld where the metallurgical damage coincides with the severe discontinuities in weld contours. Undercutting is common with many electrodes in the hands of an inexperienced welder. With an undercut and its attendant stress concentration occurring just at this damaged zone in the parent metal, failure under repeated stress is imminent and certain. Other types of stress concentration occur in welded structures and they also must be eliminated.

The general subject of corrosion resistance of the weldable materials can be covered amply by the statement that there are many weldable materials with remarkable resistance to salt water corrosion. The flexibility of the welding process enables incorporation of these materials in the structure, where they are necessary. The admirable record of wrought iron hulls in salt water could be duplicated in the water jacket of a welded steel crankcase. The stainless steels, nickel-clad steel and other clad metals, all are possibilities. Two of the early welded engines were galvanized in the region of the water jackets and two-years in salt water service proved them to be entirely adequate.

Fig. 1 shows a 4-cycle marine engine crankcase, with its welded bearing girders. Early crankcases were of tie rod construction, the welded steel case serving as a stabilizing medium for the tie rods. It is a common misconception that the tie rods take all the load. Tie rods, if they are screwed up and set properly by means of strain gages, bring into play the rigidity of the crankcase. The material which is compressed when the rods are screwed up adds its flexural rigidity to the flexural rigidity of the rod.

It is just as important in the case of tie rod construction to eliminate stress concentrations as it is in the case of an engine in which the gas load is carried entirely by a weld. The frame is subjected to the same alternations of stress whether the tie rods are in place or not. The only condition under which the frame can be entirely relieved of stress occurs with loose tie rods. The engine shown in Fig. 1, was built of low carbon welding quality steel with endurance values for an indefinitely repeated stress of 30,000 pounds per square inch. The weld metal used to join the components had an endurance limit of 28,000 pounds per square inch established by rotating beam test on all-weld metal specimens. It was then a matter of eliminating all undercuts, unfused welded joints, and surface discontinuities of any type, since it is easy, at an average stress of 5000 pounds per square inch, to incorporate a stress factor of 5 or 6, which would legislate against indefinite service life. The crankcases weigh about 5 pounds per horsepower.

An installation of the same general type of crankcase with the exception that the two engines are 2-cycle and slight modifications were made in the cases to take care of this feature, form part of the Winton Engine Corp.'s exhibit at the Century of Progress in Chicago. These units have been in continuous operation since the opening of the fair, supplying power and light to the General Motors building. The installation, including generator and sub-base, has a specific weight ratio of 39 pounds per horsepower; the specific weight ratio of the engine itself is 20 pounds per horsepower.

Tie Rods Are Eliminated

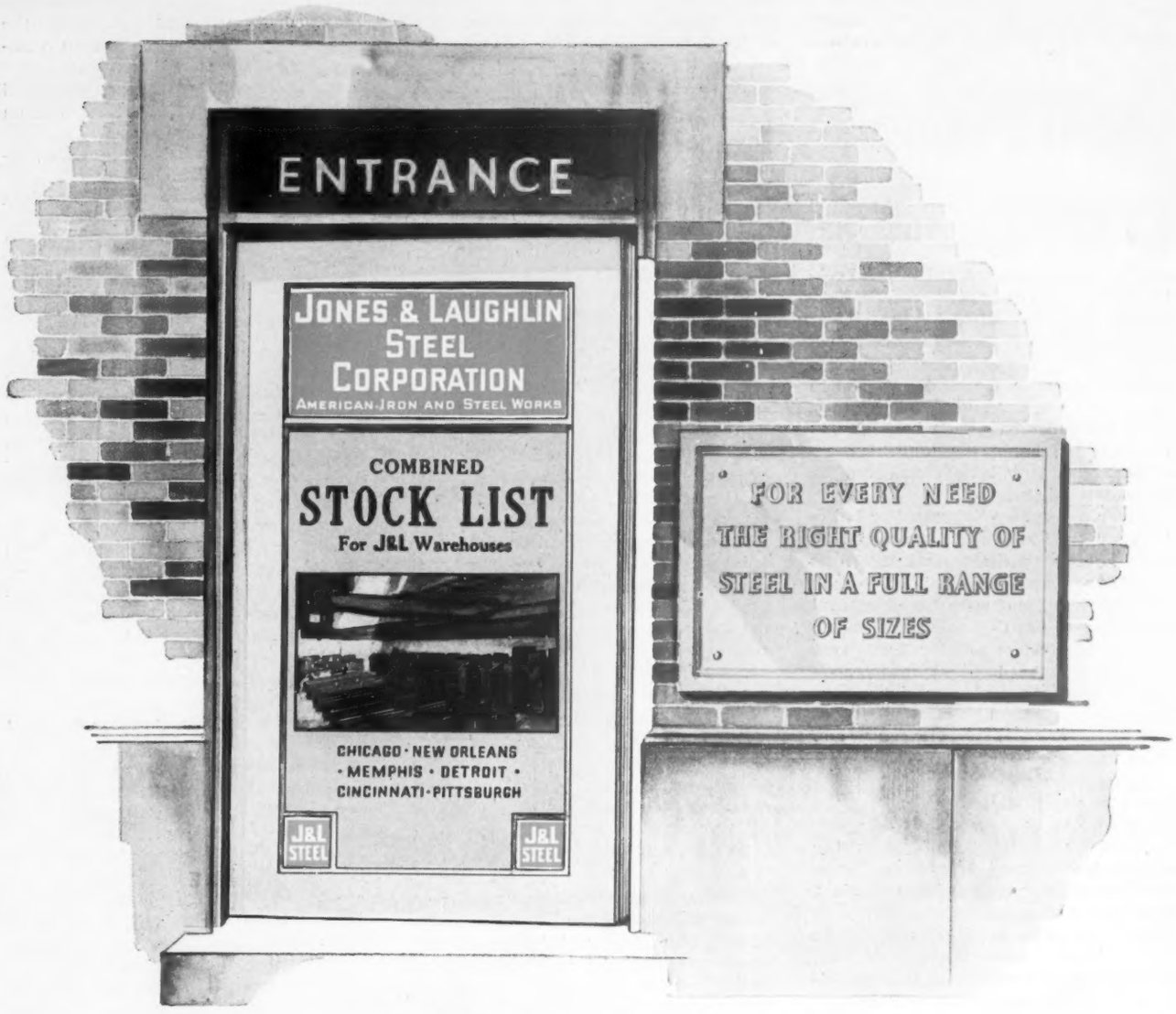
To eliminate still more weight in steel crankcases, the construction of a case in which the gas and inertia loads were carried entirely by the welded structure was initiated. With the tie rod type of construction, much material is not working effectively, especially if the tie rods are not set properly. In a welded unit, better distribution of the stresses can be achieved because of the monolithic construction.

An experimental single-cylinder frame was built, embodying a main frame flame-cut from a plate of steel 2 inches thick. This model was subjected to strain gage tests to determine the efficacy of the conception. Fig. 8 shows the main frame as cut out for the model test engine, and Fig. 7 shows the built-up single cylinder unit. The main frame was joined by welding to the top deck, into which the cylinder head studs were tapped. This frame showed satisfactory deflection and stress characteristics.

An effective method of determining points of maximum stress in a three dimensional structure is to paint it with a varnish possessing a low modulus of elasticity and a low yield point. When a static load is supplied to the structure, the varnish cracks at the point of maximum stress while the structure is only lightly loaded. The varnish method shows points of maximum stress with a single application of a load and the load at which the varnish cracks correlates a wealth of information about stress factors and fatigue performance. Needless to say, the varnish will crack first at those points where experience dictates a large radius. It will crack at the contours of an improper weld. It will crack at the root of an undercut.

(To be concluded)

PORCELAIN ENAMEL ON PARADE: All varieties of porcelain products, from cooking utensils to burial vaults, are on display at the co-operative exhibit of the industry at A Century of Progress exposition in Chicago. Covering 1600 square feet, the exhibit comprises a central educational exhibit, flanked by left and right wings of 44 individual exhibits, the right wing being shown here. The entire display is sponsored by the Porcelain Enamel institute, Chicago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Design Factors Favorable to Steel Frame Residences

DIFFERENCES between the conditions which govern the use of steel in tier buildings and in residences are emphasized in the booklet "Steel Framing for Small Residences" just published by the United States Steel Corp. to summarize a survey made by its subsidiary companies investigating the demand for steel in residence construction and seeking to simplify design. This booklet was reviewed briefly in the Aug. 21 issue of STEEL, but will be considered in more detail here.

Major differences between tier buildings and residences are presented in the accompanying table and, it will be noted, they favor the residence field. Engineering handbooks on structural steel are not entirely adequate for use with small residences, for they were intended to apply to construction, such as tier buildings, wherein dead loads are comparatively large, and whose structural members must be self-sufficient under all circumstances.

In residences, conditions are different. Outstanding is the fact that the dead load is proportionately less and that under some circumstances the steel members may be assumed to be strengthened by enveloping materials. The frame of a residence designed in accordance with handbooks would be safe but would be so heavy as to form a commercial handicap which experience indicates may not be necessary.

Loads May Be Averaged

A further difference between tier building and residence design is the extent to which short cuts are permissible. In designing a tier building it is correct to compute all load reactions separately, but in residences many loading conditions may be averaged without affecting framing sizes which should be used.

In residences, it is customary to apply the term column to any main vertical member supporting a considerable floor, roof or wall area, or a large concentrated load. The term stud is applied to less individually important vertical members spaced at intervals in a wall or partition and which usually are subject to bending in one direction in addition to axial compression.

The basis of design for residential columns does not differ from that given in handbooks. Steel members composed of cylindrical pipe or wide flange H sections will prove efficient for heavier loadings. The symmetrical section of a steel pipe column combines maximum strength per pound of metal with a neat appearance. When no lateral connections are required, as in a member extending through only one story, the pipe form of column is especially suitable.

In many successful applications of steel to residential framing the sections used as studs, while reasonably deep on their major axis, are quite narrow on their minor axis. Rolled steel channels and built-up members, 8 to 10 feet long and 3 or 4 inches deep, but only 1½ inches wide, are common practice. After completion of the residence the unbraced length of the stud is reduced by anchoring it at intermediate points along its length to the enveloping wall materials, but during construction the unbraced length of these studs may give a slenderness ratio ranging up to 300.

Extend Scope of Formula

Handbooks give no design data for members whose slenderness ratio exceeds 200. To provide for this condition, scope of the column formula of the American Institute of Steel Construction has been extended to give allowable unit stresses for values between 200 and 300.

A second condition not contemplated in handbooks is that in residences whose walls enveloping a stud are composed of an adequate thickness of well bonded, substantial material, such as brick, hollow tile, stone, concrete or well-backed steel panels, it appears entirely proper in design of the stud to take cognizance of the stiffening action provided by the enveloping material.

This stiffening effect of the envelope may be utilized advantageously in residences. During construction of the frame this effect does not come into play, consequently at that stage the studs must be stiff enough to withstand the moderate loads resulting from the weight of the superimposed steel parts and any temporary erection conditions.

The importance of straightness, especially in long slim studs, should be kept in mind. Care must be taken during the erection to avoid slight bends or kinks as may invite local buckling under loads below the designed capacity of the stud.

Bracing During Erection

Proper bracing of a framed house is of great importance. During construction the steel framing as a whole should be sway braced against distortion from wind or accidental forces. A horizontal load of 10 pounds per square foot on exposed surfaces should be provided for.

This may be done by use of long diagonal guy wires or rods in vertical planes connecting rigid studs to rigid girts at all salient and re-entrant corners. Diagonal knee bracing may be used, but its efficiency is limited by the transverse stiffness of the studs and girt to which the braces are connected. In some cases, sufficient stability is obtained by use of temporary diagonal planks. When guys are used they can be arranged so as to clear all openings, and they may be left permanently in place.

In some cases a steel stair may be arranged so that its sloping stringers provide efficient sway bracing for part of the residence. After the residence is completed, the filling material of both walls and floors affords added stiffness to the assembled structure.

In the design of floors, conditions in residence construction differ from those prevailing in their buildings in two important respects: (1) The demand for a minimum depth of floor is even more insistent; and (2) the live load to be provided for usually exceeds the dead load. Total load usually is small enough to permit advantageous use of

Comparing Steel in Buildings and Residences

Features	Tier Buildings	Residences
Loading	Dead exceeds live	Live exceeds dead
Bracing effect of material enveloping the steel framing	Disregarded in design	Utilized in design
Computation	Loads and reactions considered individually	Loads and reactions averaged
Vertical members	Columns, having low ratio of slenderness, continuous through several stories	Studs, having high ratio of slenderness during construction, only 1 story high
Horizontal members	Spandrels one panel long	Girts continuous through several panels
Floor thickness	Comparatively deep	Shallow
Floor deflection	Usually negligible	Usually critical
Fabrication	Somewhat elaborate	Simple
Erection medium	Derricks	Manpower

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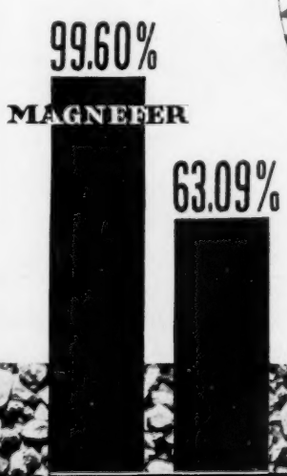

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light shallow sections but, to avoid cracking of plaster ceilings, this construction must be accompanied by provision that the live load deflection shall not exceed 1/360 of the span. This deflection requirement is not new.

If it is desired to use open web joists the standard specification published by the Steel Joist institute will prove helpful. This specification also covers metal lumber joists.

In tier buildings it is practice, except in case of setbacks, to make the vertical well columns continuous and to break the horizontal floor framework of beams and girders. In residence contruction the vertical wall studs are placed much closer together and are of light section. To provide for an elastic arrangement of door and window openings it is both desirable and feasible to make the studs noncontinuous by breaking their

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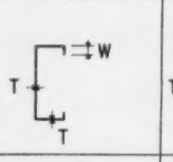
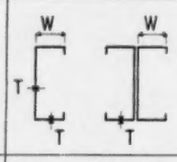
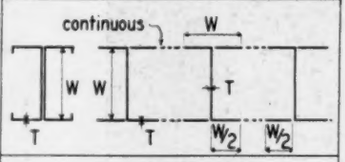
LOCATION OF EFFECTIVE ELEMENT			
RATIO W/T	10	30	100

Tentative ratios of flat width (W) to thickness (T) of element to be assumed as effective in computing the geometric properties of individual sheet metal sections

length at each floor level. It is then advantageous to dispose the horizonal girt framing, including also sills and eaves plates, in continuous courses along the entire length of each side of the house. This permits the girts to:

(1) Tie together ends of the studs; (2) provide a bearing seat for ends of the joists or rafters; (3) transfer the load from joists or rafters to adjacent studs; and (4) act as struts to withstand stress of long diagonal members used as sway bracing.

Some systems of steel frame construction use members, popularly called metal lumber, made of this steel supplied in the form of flat sheets or rolled strip, the members subsequently being shaped by cold bending or rolling, with or without welding. Employment of sheet steel for other types of framing such as studs, girts, and cellular and panel construction, is quite recent, and the probable behavior of untested sections, whether employed alone as framing or combined with covering is not known sufficiently well to warrant formulation at this time of definite rules for their use.

Up to the present, little information has been made available that will permit architects or engineers to prepare even a preliminary design contemplating use of new forms of sheet steel as structural members. It is well recognized that large unbraced areas of thin gage material will buckle when subjected to bending and compressive stresses. The strength of such sections can be substantially increased if stiffened by flanging their edges.

One of the important questions concerns the width of the elements of the section which can be considered effective to resist bending or compression stress. As a reult of a study of repreentative American and European practice, a tentative basis on which metal lumber designs may be computed for preliminary purposes is offered in the accompanying sketch. In each case the design should be checked by full-size tests before it is adopted for use.

Steel framing of a residence may be connected by riveting, bolting or welding. Strength values for rivets and bolts given in the standard specifications for structural steel for buildings of the American Institute of Steel Construction have been adopted widely and seem suitable for residence construction. Welded connections may be made either by a fusion or resistance process, the resistance method being especially well suited to shop welding of thin material. Two publications of the American Welding society, its code for fusion welding and gas cutting in building construction, and the report of its structural steel welding committee, will be found helpful in connection with fusion welding.

Miss America X To Have Monel Metal Propellers

Final laboratory tests on the monel metal shafts for Gar Wood's Harmsworth trophy defender Miss America X have been completed and reveal a high range of physical properties. They have been shipped to Detroit for tests in actual service.

Each shaft is 1⅝ inches diameter and 10 feet 4 inches long. Breaking strength is 110,000 pounds per square inch and yield point 100,000 pounds per square inch. Tests reveal an elongation of 18 per cent in 2 inches and a 60 per cent reduction of area. These shafts have a modulus of elasticity of 26,000,000 and are strong enough, if they could be used vertically as a lifting bar, to lift a load of 131 tons.

This is said to be the first time that a nonferrous material has been used where such tremendous power is involved, although monel metal shafts have been used widely for pleasure and racing craft because of their strength, immunity to rust and rigidity. Each of the twin shafts on Miss America will be required to transmit 3170 horsepower. One of the determining factors in the selection of monel metal was the fact that close technical control possible in its production provides uniform freedom from hidden defects.

The cup defender also will have monel metal wheels, which in test have shown unusual strength and resistance to deformation. In the gold cup races, which will precede the Harmsworth trophy contest, all contenders will be equipped with propellers of this metal.

Metal Treating Plants Join In National Institute

Twenty metal treating firms had representatives at the Medinah club in Chicago on Aug. 18 and established a national organization for those engaged in commercial metal treating, to be known as the Metal Treating institute. By-laws were adopted and a code committee appointed.

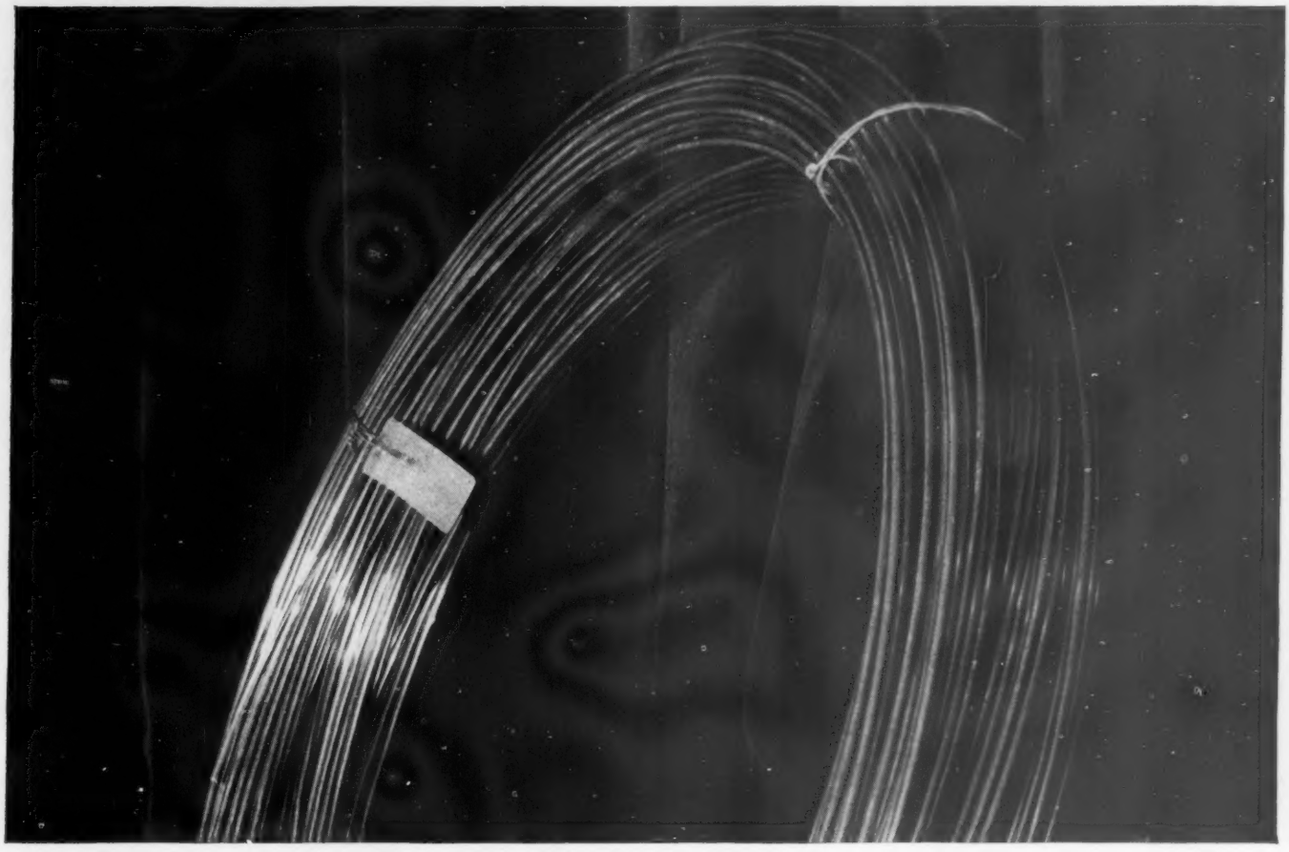
The following officers were elected to serve until the next meeting of the institute, which will be held at Hotel Statler, Detroit, on Oct. 2, during the National Metal congress and exposition: President, C. U. Scott, president, C. U. Scott & Son, Rock Island, Ill.; vice president, T. E. Barker, president. Accurate Steel Treating Co., 2226 West Austin avenue, Chicago; treasurer, W. S. Bidle, president, W. S. Bidle Co., 1408 East Forty-seventh street, Cleveland; and secretary, W. H. Eisenman, 7016 Euclid avenue, Cleveland.

Commercial metal treating companies interested in becoming members of the institute and participating in the code are requested to communicate with the secretary.

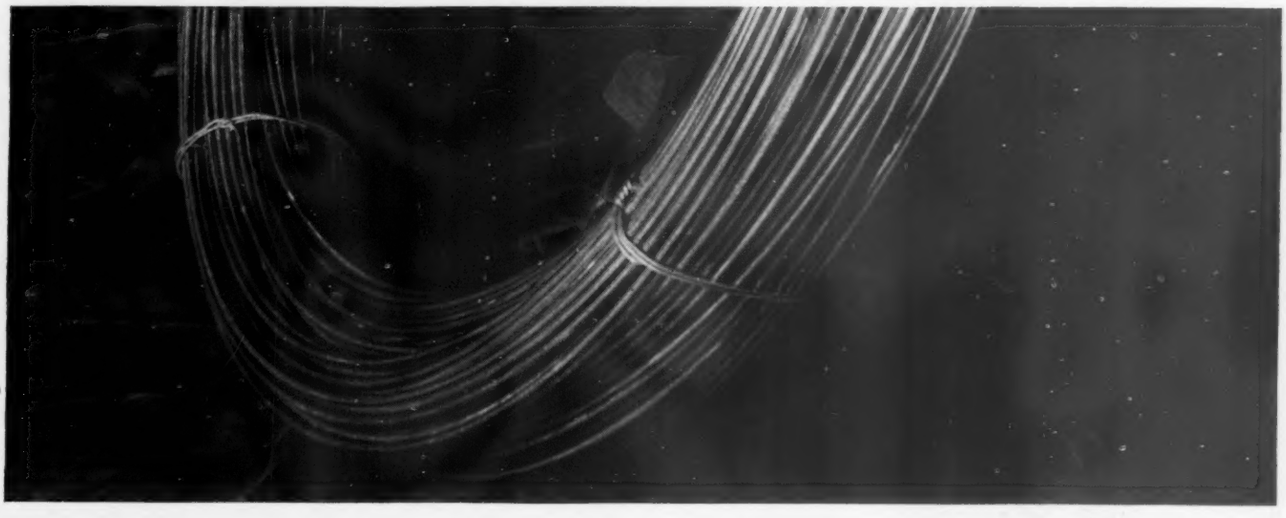
Assists Heating Unit Design

For quick determination of data involved in the design of coiled heating units, Hoskins Mfg. Co., Detroit, has made available through distributors a 6½ by 3½-inch sliding card chart which correlates the various factors of wire size, length, wattage, current and resistance.

YOUNGSTOWN



MANUFACTURERS



WIRE

Special analysis Wire to exacting specifications.
THE YOUNGSTOWN SHEET AND TUBE COMPANY
General Offices - - - YOUNGSTOWN, OHIO

Seen

at A

CENTURY OF PROGRESS

EXHIBIT of Link-Belt Co., Chicago, is enclosed by ornamental models of conveyor chain links. The models resemble chromium plated metal and with a special lighting system constitute a distinctive exterior. The link models reach to the ceiling and the link forming the main entrance has a width of 22 feet. The color scheme of the exhibit is a distinctive shade of light blue with silver and gold finishing and trimming.

By dioramas and translite illustrations, the company portrays many of the modern methods in handling materials mechanically. The dioramas are mounted on display cases built to accommodate full-size products, giving the visitor an opportunity to see the conveyors in both miniature and diorama form, and at the same time to obtain an idea of construction and size of many of the machinery parts.

Twenty-five dioramas are shown, each depicting equipment, and each is a combination of an oil painting background and a miniature model foreground, reproduced true to major mechanical details of machines. The translites also are 25 in number and are large illuminated colored glass photographs. They depict installations of conveyors, each installation employing the particular type of chain of which a chromium or cadmium plated sample link is displayed in the case containing the translite.

In the middle of the exhibit is a five-sided obelisk extending to the ceiling. On it is mounted an attractive display of the company's line of positive drives for transmitting power without slip. A large oil painting showing a composite view of the company's factories and warehouses forms a part of the decorations. Other interesting features are a "mystery" drive and an operating model of a rotary railroad car dumper.

• • •

Nearly ten tons of steel went into the 100 directional sign posts distributed over the fair grounds to direct visitors to various buildings, concessions, and the like. These posts were designed and fabricated by the Mid-West Forging Co, Chicago, and offer the advantage of pointing to locations in four directions. As many as 16 signs may be incorporated in one post, as shown by the cut, below left.

Posts are made of 3-inch diameter galvanized pipe, 17½ feet long, embedded 4 feet in the ground. Two octagonal-shaped plates are welded to the top section for decorative purposes, the pipe end being closed by an acorn cap. Signs are of composition material, not steel, and are bolted in place to steel sections which are welded to the post. Bolt fastening permits easy removal of the signs.

• • •

Comparison of the old types of farm machinery with modern equipment, as seen in the exhibit of the International Harvester Co. illustrates the strides which have been made in the consumption of steel in the building of agricultural machinery as well as in the development and perfection of such units.

A duplicate of McCormick's first reaper, built in 1831, is made largely of wood. Iron bolts, a few rods and gears are the sole exceptions to wood construction. Contrasted with this crude but noted machine is a modern 16-foot harvester-thresher in the manufacture of which steel and iron are the predominant materials. The same is true of the mower, cotton picker, corn picker and plows displayed.

The harvester-thresher can cut five times as much grain as its predecessor of 1831 could accomplish and, in addition, threshes and cleans the grain, eliminating intermediate handling operations such as binding, shocking, bundling and hauling. Two farmers now can do more in ten hours than they could do in three months by hand labor methods 100 years ago.

• • •

Crane Co.'s exhibit of industrial products in the Electrical building is a comprehensive one, featuring its various types of valves, fittings, steam traps, etc. A replica is shown of the first Crane plant, built by R. T. Crane in 1855. Crane Co. also has a separate building of its own for the display of domestic products in which modern bathroom and plumbing fixtures are contrasted with those of years ago.

• • •

A short section of track located near the Travel and Transport building illustrates the use of the GEO type of track construction manufactured by subsidiary companies of the United States Steel Corp. This con-

struction is more rugged than the ordinary type of tie plate and spike fastening and gives longer life to rail and tie. Detailed description of this product was published in STEEL, Aug. 6, 1931.

• • •

World's fair officials estimate that the exposition has created, directly or indirectly, jobs for 100,000 persons and that, from present indications, it will result in total expenditures of $500,000,000 before it closes Oct. 31. Recently the fair directly employed 29,000 persons, while hotels and shops in Chicago are credited with hiring 20,000 more to take care of the increased business resulting from the influx of visitors. Railroads have added men to accommodate heavy passenger traffic.

Crowded hotels and multiple-section passenger trains are in strange but pleasing contrast to the bleak conditions of 1931 and 1932. Baltimore & Ohio railroad was forced to take a large locomotive out of its exhibit at the fair and substitute a smaller one, as the larger unit was needed to handle the increased traffic. Passenger traffic on some roads has set new records.

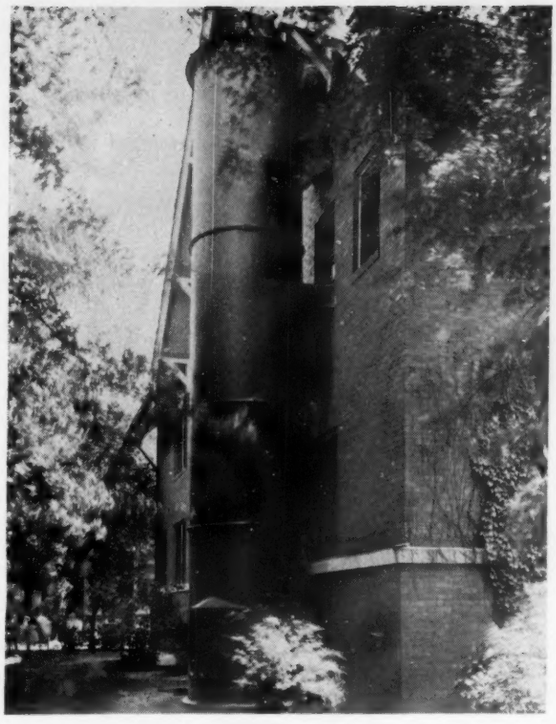


Photo courtesy Lawrence Mfg. Co., Omaha, Nebr.

◆

AN EXTERIOR-type sliding fire escape installed on a 3-story building. Both the housing, which is 5½ feet in diameter, and the slide, are constructed of copper-alloyed steel sheets. Weight is about 100 pounds per vertical foot. Interior fire escapes of the some type weigh about 40 pounds per vertical foot

◆

LARGE USES OF STEEL IN SMALL WAYS

247th Article ◆ Sliding Fire Escapes

WHILE steel is an important factor in making modern buildings fireproof, it is of equal value in preventing loss of life in the event fires do occur. For many years the fire escape has been an integral part of all larger structures and steel generally has been employed in its construction.

The stair-type of fire escape still is most commonly used although a few years ago the sliding fire escape was designed to give greater protection to building occupants, being particularly adapted to use in schools and hospitals.

It is found that injuries suffered from fires more frequently are a consequence of smoke and the rush to escape from the structure than of the flames themselves, and the sliding fire escape, in addition to shielding the individual from fire and smoke, materially increases the speed of egress. The stair-type escape offers no protection from flames issuing from windows below, has a small capacity which may result in congestion and a stampede, with consequent injuries to its users, and is restricted to the use of able-bodied persons.

Several types of sliding fire escapes now are available, these being the exterior spiral and interior spiral slides as well as the tubular spiral and straight tubular types. The accompanying illustration shows a typical exterior spiral escape installation.

Slide of Steel Sheets

This construction has its own housing, whereas the interior type employs the wall of the building to carry the spiral slide. The base of the escape is made of reinforced concrete. Copper-alloyed steel sheets are used for the slide as well as for the housing which is 5½ feet in diameter. For the base section, 14-gage sheets are employed, the remaining sections for a 65-foot escape being made of 16-gage material.

The housing is anchored to the building with four ½-inch anchor bolts, while each section has stiffeners of 1¾ x 1¾ x 3/16-inch tees. The helix, around which the individual slides, is 30 inches in diameter and made of 20-gage galvanized sheets. It is supported by the housing with 1¼ x 1¼ x ⅛-inch tie angles. Helix segments are held together by double seaming to form a spiral section, these sections being fastened by 20-gage galvanized draw bands.

Entrance to the escape is made direct from the room and is closed by two doors which swing open with exit travel. A bar laterally transposed at the top of the entrance releases the doors when it is pulled down. The exit at the lower end of the helix is oval shaped, 30 inches wide and 36 inches high and is made of 16-gage galvanized sheets. The line of travel at the exit is an easement or parabolic curve.

Suitable for High Buildings

This type of fire escape weighs about 100 pounds per vertical foot and, as indicated, most of this weight consists of sheets. Interior fire escapes, lacking the steel housing, weigh only about 40 pounds per vertical foot. This equipment may be employed for buildings 20 to 30 stories high as well as for two and three-story structures, although for the larger installations heavier-gage steel sheets are required for the housing construction.

The spiral tubular type of fire escape uses a vertical galvanized pipe, anchored to the base and to the building wall, to support the helix which coils about it. Straight tubular fire escapes may be used for small buildings, but are not adaptable for high installations since the descent would be too swift. They consist of a straight tube, 30 inches in diameter, commonly made of 20-gage galvanized steel sheets. The slide is supported by wall brackets and mounted parallel to the wall, being inclined from the top floor to the ground.

Rustproofing by Electroplating

INVOLVING the electrodeposition of alloy metal, a new rustproofing process recently has been developed by the Northern Distributing Co., 719 Vance building, Seattle. Applicable to all ferrous metals in the cast or rolled form, the treatment is made by submerging parts to be treated in a bath at room temperature for a period of from 7 to 10 minutes. Any standard type electroplating equipment may be used, current required being 4 amperes per square foot, at 6 volts.

Cost ranges from ⅛ to ½ cent per pound of treated part for labor and materials. On thin sheet stock,

BETTER PRODUCTS COME FROM BETTER PIG IRON

About 80% of the pig iron produced in this country is used in the making of steel. Most of the remaining pig iron finds its way into gray and malleable castings with a market value of close to a billion dollars annually. With 5,000 foundries in operation in normal times, it is reasonable to conceive that keen competition exists within the industry—a competition that makes constant demands for bettered products.

Republic is helping foundries seeking for higher quality in the finished castings by supplying two dependable grades of iron.

NIAGARA is a uniform iron made from Lake Superior ores by a carefully-controlled process. Its uniformity and scrap-carrying qualities have earned for it an enviable reputation. It is made in foundry and malleable grades.

PIONEER is a clean, chill cast southern iron uniform in weight and analysis. For years it has been a favorite among exacting foundrymen.

Foundries looking for ways to better quality should make tests to determine the improvement that Republic Pig Iron will produce.

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES: YOUNGSTOWN, OHIO

this cost figure is said to average 1/16 cent per square foot.

The deposit, known commercially as Electroloy, is claimed to penetrate any surface voids on material being treated, and results in only a slight increase in dimensions, thickness of the layer of plating being approximately 0.0005 inch or less. The unpolished, natural appearance of the finish is similar to silver; it may be buffed to a high luster. The deposited alloy is made up of a number of nonferrous metals, including cadmium.

Good resistance to atmospheric corrosion is reported. Electrolysis is avoided, according to the originators of the process, reaction of the plated coating to iron in the presence of an electrolyte being similar to that of lead under similar conditions. Corrosion resistance up to a temperature of 600 degrees Fahr. is claimed.

It is further stated that the deposit will not scale or peel, and is unaffected by bending or twisting of the part treated.

Windows of Washington

(*Concluded from Page* 13)

the recovery act might be thrown into the courts and the entire program wrecked. General Johnson has apparently preferred a middle ground.

True, the American Federation of Labor has derived great moral support from section 7a, but the Johnson radio statement is plain in erasing both open and closed shop from the lexicon of the NRA. The law does not prohibit a company union, General Johnson has made plain. It is up to each industry to fight its own battle, but since when has an open shop industry not had to combat unionism?

In the coal industry the campaign of the United Mine Workers against nonunion operators has been so persistent that the negotiations at Washington whereby both sides are sitting around the table is not a fair criterion of the labor situation. Steel and automobile represent the citadels of the open shop.

Consideration of the automobile code developed the impression among manufacturers that General Johnson tacitly acquiesced in the open shop provisions of that code when he flew to Detroit several weeks ago. It is possible that the industry may stand pat for some inclusion in the code referring to its open shop status, and the issue may go to the President.

It would be a strange situation if General Johnson should prove a reliance for industry, but that is possible. His retirement when the organization work is completed would leave Mr. Richberg, long counsel for railroad labor, the crown prince.

There is increasing evidence that General Johnson is becoming weary of his post, and the wonder is that it has not already engulfed him. The ramifications of NRA have attained proportions beyond the scope of one brain.

Recently, he has contradicted printed statements issued by his own office, indicating the impossibility of holding all the reins in his hand.

Henceforth organized labor is not likely to be as strong a partisan of the general, and some of the President's advisers are said to be apprehensive that the general's name on the front page of every newspaper daily may detract somewhat from the glory of their chief.

It has happened before that devious rumors of resignation have disclosed deep-seated opposition and foreshadowed the turn of events. General Johnson is now looking for the persons who circulated the report he would resign shortly.

REVERSING the quip about the United States, the steel industry appears to have lost the war but won the peace.

The industry's "press" has been deplorable. At the code hearing July 31, when the open shop provision was withdrawn according to a prearranged agreement, steel executives offered no explanation while labor claimed a victory. It remains to be seen how much the industry complicated its struggle to maintain the open shop by permitting headlines that steel had capitulated to labor to flood mill towns.

When Charles M. Schwab and Myron C. Taylor saw the President the day following the walkout of steel executives upon William Green, president of the American Federation of Labor, it was not at the demand of the President but upon the request of the steel executives themselves. The facts concerning this walkout on Mr. Green were entirely favorable to steel, but labor and not steel executives did the talking.

When the code was signed Washington hastily gathered that General Johnson had clinched another victory, but as the code is studied it appears that the industry got what it proposed and that NRA accepted the industry's suggestions in regard to hours, wages and working conditions, except the deleted open shop clause, in preference to alternatives proposed by both organized and radical labor organizations.

Most important of steel's gain is the price control arrangement which enables the industry to police itself and ultimately requite itself for increased costs incurred in shortening the work week and stepping up labor rates.

The 8-hour day provision is the biggest mystery in the entire code, as only one company—a producer in southern Ohio—may be said to be strictly on an 8-hour day at present. It was statistics supplied by this company that smoothed over final acceptance of the code by Dr. Alexander Sachs and Isador Lubin, of the department of labor.

Incidentally, Secretary of Labor Perkins will shortly appoint an interdepartmental committee to watch the operation of the labor provisions of the steel code. General Johnson also is naming soon the committee of three, of which he states he will be one, to sit with directors of the American Iron and Steel institute on prices.

PUBLIC works program affords an unusual opportunity for the elimination of many dangerous grade crossings. The necessary money is available and the machinery for action is in good running order. Nevertheless there is danger that this chance of a lifetime may be fumbled.

Prior to the enactment of NIRA, grade separation work had almost ceased, largely through the inability of the railroads and local governments to finance it. Part II of NIRA, dealing with public works, provides a fund of $3,300,000,000, about $400,000,000 of which is earmarked for roads. It lies within the discretion of PWA to use part of this road money for grade separation projects. Use of the funds for this purpose would relieve the railroads and the local communities of all expense in connection with the work. It is an outright gift by the government, intended to stimulate employment.

Each state has been allotted a certain sum for roads. The state highway departments submit proposed plans to PWA, through the bureau of public roads. If the proposal is sound and meets with certain requirements, it may be approved. One of the requirements is that the project will provide employment in a locality where unemployment exists. Another is that the plans for the project are far enough along so that work can be started promptly.

A number of authorities in the bureau of public works and in PWA are optimistic over the possibility of expediting considerable grade separation work through this plan. Others are fearful that lack of initiative on the part of state highway departments, failure to submit plans promptly and wrangling over the allottment of funds within states will retard the program.

In some quarters, it is felt that the President could cut through all of these obstacles by arbitrarily setting aside a definite sum for grade elimination, just as he earmarked fixed sums for the navy program and for roads.

The iron and steel industry is directly interested in this problem, because aside from the reinforcing steel in roads and the structural steel in highway bridges, the only remaining possibility for steel demand in the gigantic road building program lies in grade separation.

Analysis of Factors Influencing

Rolling Pressure and Power Consumption In the Hot Rolling of Steel

BY SVEN EKELUND

Translated by BENGT BLOMQUIST

Part I—Dynamical Conditions in Contact Area Between Rolls and Bar

(Second Article of Series)

IN ORDER to check the formulas and also to study this problem from a more practical standpoint, a few rectangular bars were rolled on a 28-inch, 2-high reversing mill with plain rolls. When the bars had been rolled halfway through, the mill was stopped and reversed. Thus, the portion of the bar, which had been in the region of compression, was preserved and could be studied. Previous to the rolling, the bars had been prepared in the following manner:

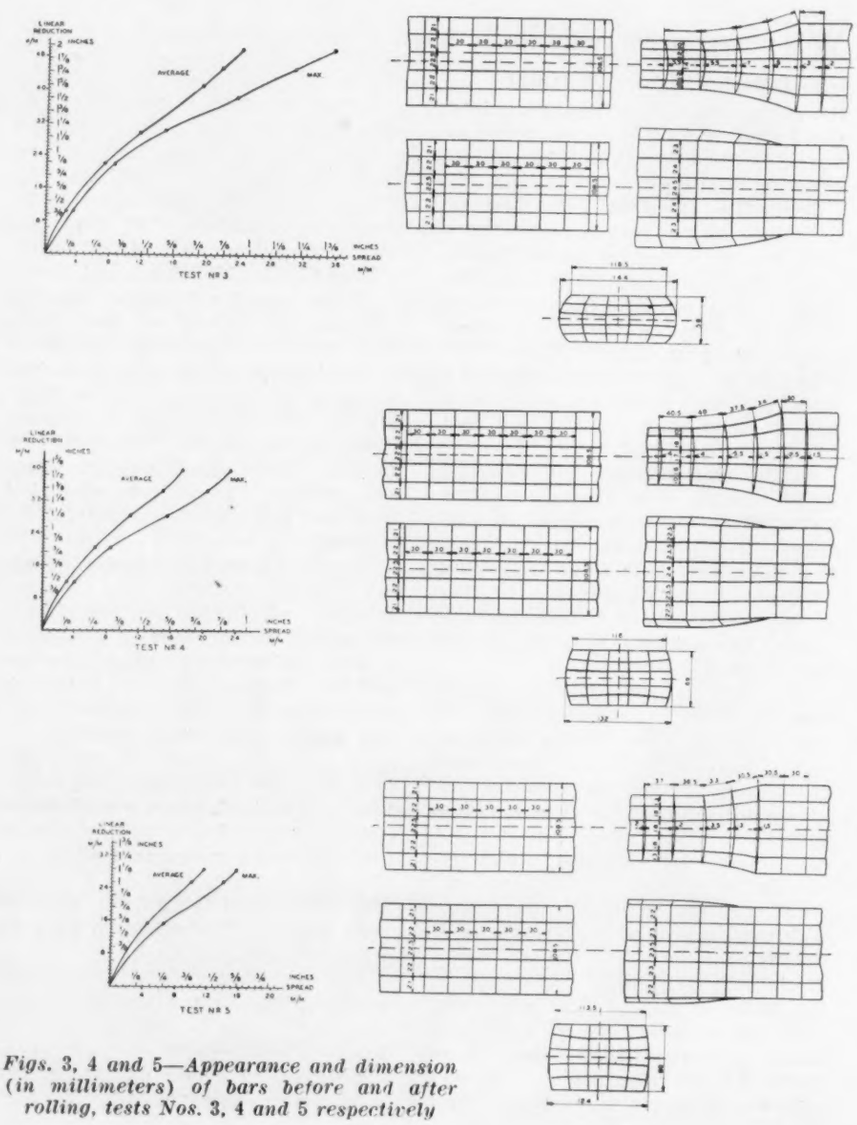
Each side of the bar was covered by a network of intersecting shallow V-shaped grooves, equally spaced longitudinally and transversely. The distance between the grooves was 30 millimeters (1.185 inches). On some of the bars, however, the longitudinal grooves on the upper side (the bar being in the same position as during rolling) were slightly closer together, but they always were spaced symmetrically. The rolling was carried out slowly, and no difficulties were encountered in stopping and reversing the mill at the right moment. The primary data of the experiment are given in Table II.

Soft Carbon Steel Used

The composition of the steel used in these tests is as follows: Tests 1 and 2: Carbon, 0.15; manganese 0.30; and, phosphorus, 0.07 per cent. Test 3, 4 and 5: Carbon, 0.05 manganese, 0.25; and, phosphorus, 0.03 per cent.

Figs. 3 to 7 show the appearance and the dimensions of the bars before and after rolling. The decrease in external dimensions, which results from the oxidation of steel when heated, was measured as 0.5-millimeter (0.019-inch) on each side; and to allow for this, the initial dimensions have been reduced by 1 millimeter (0.039-inch) on the diagram.

From each of the tests the conclusion can be drawn that the bar inserted between the rolls is subjected to a continuous elongation in the zone of contact. No part of the surface has remained unchanged. It also will be seen that the maximum spreading occurs at the center part of the free sides. The spreading, which takes place in the surface of contact, is distributed evenly between the center and the edges. The backward bend of the vertical grooves, which is set up at the beginning of the pressure zone, increases up to a certain point and then decreases as the bar is forced forward. This backward bend can be regarded as though part of the slippage at the bar surface had been moved down into the material. Thus, in order to obtain the actual surface slippage, the values calculated, according to equation (1b), should be decreased by an



Figs. 3, 4 and 5—Appearance and dimension (in millimeters) of bars before and after rolling, tests Nos. 3, 4 and 5 respectively

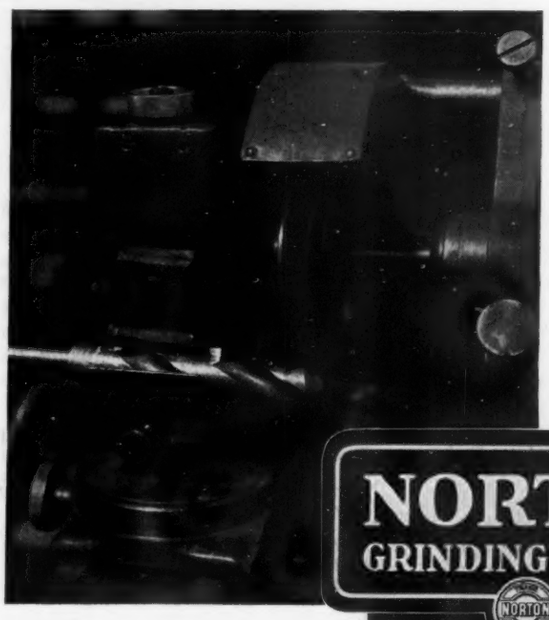
If You Have A Cut-off Job

Try These Norton Wheels

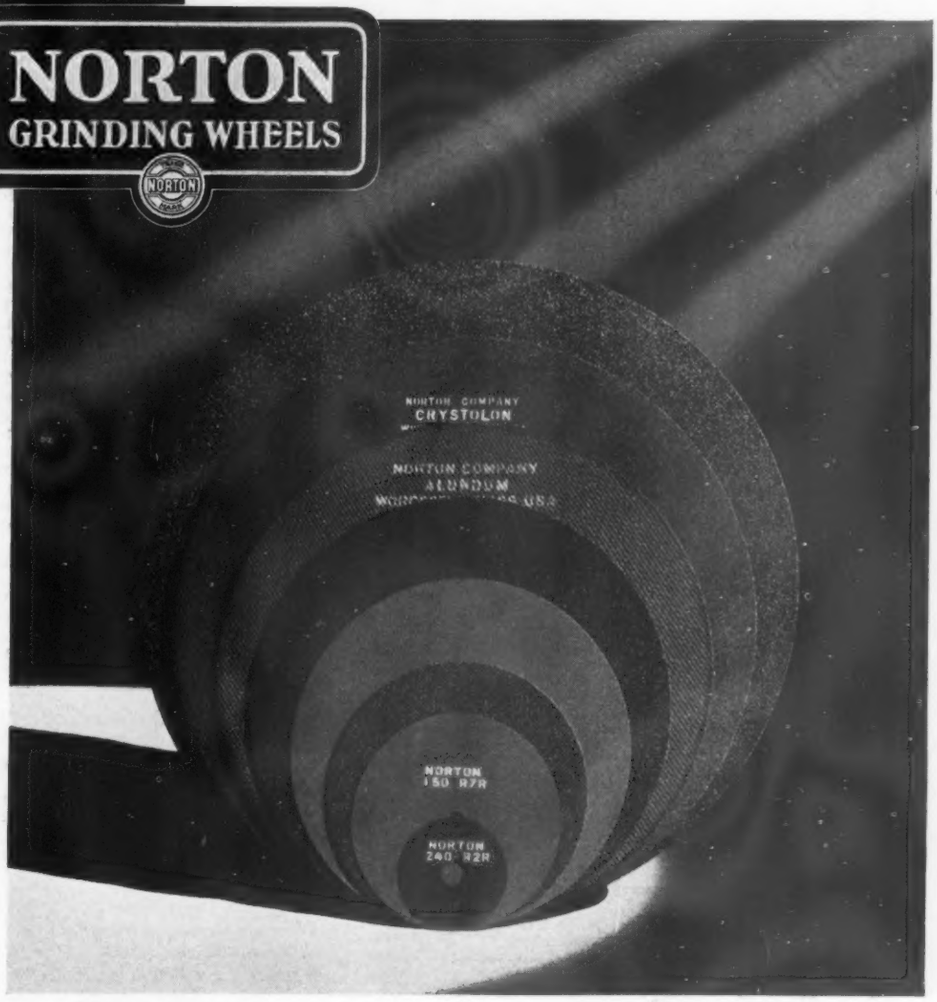
CUT-OFF wheels are being used on many kinds of work today—jobs for which a grinding wheel was considered impractical only a few years ago. You'll find them in the tool room, on the production line, in fact wherever metals or non-metals are being cut.

And for each and every cut-off job there is a suitable Norton wheel—a wheel that will do the job *right*. There are Norton wheels only .006" thick for the delicate operations and strong husky wheels for the strenuous jobs. There are wheels for high speed machines (16,000 s.f.p.m.) and for slow speed (9–12,000 s.f.p.m.).

If there is a single cut-off job in your plant it will pay you to try Norton wheels. If you are not using cut-off wheels it will pay you to consider them for operations you are doing by other means.



NORTON
GRINDING WHEELS



If clearance when cutting is a factor use the special Norton "rough-sided" wheel (third, sixth and last wheels in illustration at right).

NORTON COMPANY
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NORTON PRODUCTS—Grinding Machines; Lapping Machines • Grinding Wheels; Abrasives for Polishing; India Oilstones, Pulpstones • Laboratory Ware, Refractories; Porous Plates • Non-slip Tiles and Aggregates

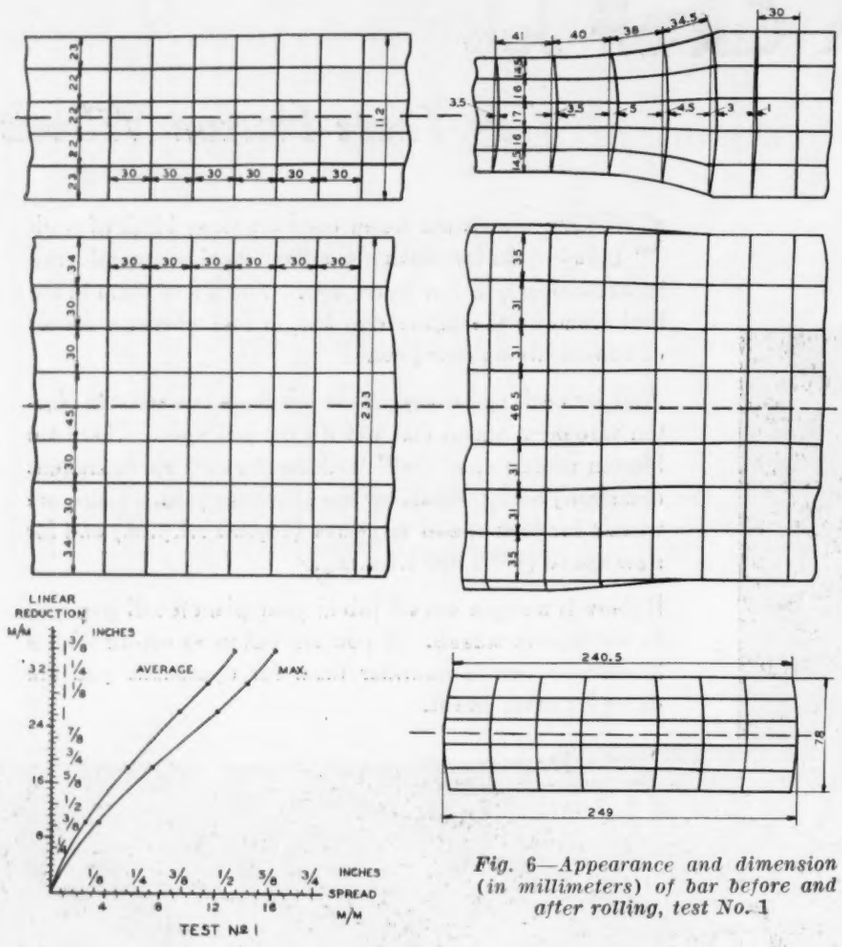


Fig. 6—Appearance and dimension (in millimeters) of bar before and after rolling, test No. 1

Table II

Primary Data of Various Tests Conducted

	Initial dimensions, inches			Linear reduction, inches	Rolling temperature, degrees Fahr.
	b_1	h_1	l_1		
Test No. 1	9.22	4.46	59.3	1.34	1740
Test No. 2	4.46	9.22	59.3	0.988	1740
Test No. 3	4.31	4.31	27.7	1.99	2010
Test No. 4	4.31	4.31	27.7	1.56	2010
Test No. 5	4.31	4.31	27.7	1.125	2010

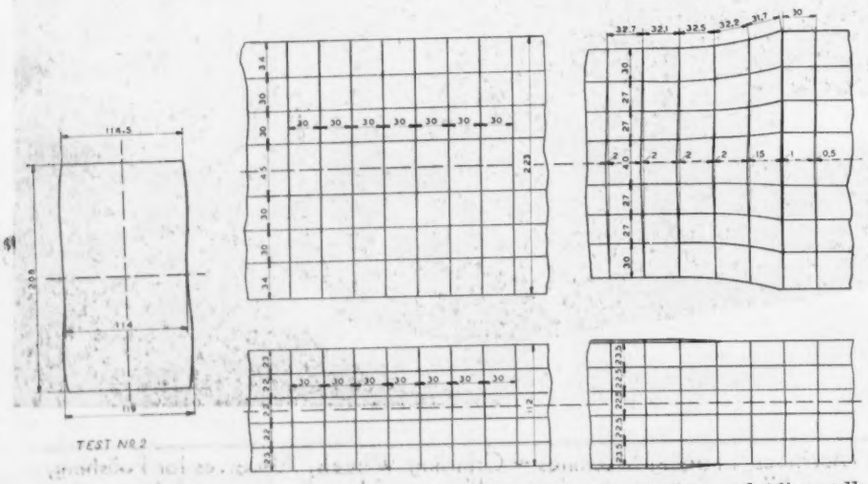


Fig. 7—Appearance and dimension (in millimeter) of bar before and after rolling, test No. 2

amount proportional to this backward bend.

In test No. 2, where h is approximately equal to $2b_1$, the maximum spreading does not occur at the center of the free sides, but above and below this point and closer to the surfaces of contact. Furthermore, the bend in this case is forward instead of backward, which probably depends upon the relation that the parts of the bar, which have greater spreading than the center, also have less elongation.

(To be Continued)

British Steel Institute Lists Papers for Fall Meeting

Autumn meeting of the Iron and Steel institute (England) will be held Sept. 12-15, in Sheffield. Sixteen technical papers will be offered on the program. Advance copies are available through the secretary of the institute, K. Headlam-Morley, 28 Victoria street, London, S.W.1. Complete list is as follows:

"Fifth Report on the Heterogeneity of Steel Ingots," by a joint committee of the Iron and Steel institute and the National Federation of Iron and Steel Manufacturers.

"The Effect of Tin as an Impurity in Mild Steel," by J. H. Andrew and J. B. Peile.

"Notes on the Utilization of Blast-Furnace Gas," by W. B. Baxter.

"Heat Conservation at the Normanby Park Steel Works, Scunthorpe," by W. J. Brooke.

"The Influence of Beryllium on Steel," by J. H. S. Dickenson and W. H. Hatfield.

"The Thermal Conductivity of Wrought Iron, Steel, Malleable Cast Iron and Cast Iron," by J. W. Donaldson.

"Alloys of Iron Research. Part XI—The Constitution of the Alloys of Iron and Manganese," by M. L. V. Gayler.

"Some Experiments on the Resistance to Wear of Nitrogen-Hardened Cast Iron," by J. E. Hurst.

"The Effect on Various Steels of Hydrogen at High Pressures and Temperatures," by N. P. Inglis and W. Andrews.

"A Coke-Fired Reheating Furnace," by F. Lloyd and R. V. Wheeler.

"Improving the Coking Performance of Weakly-Caking Coals," by R. A. Mott and R. V. Wheeler.

"Some Properties of Cold Worked Sorbitic and Austenitic Alloy Steel Wire," by S. H. Rees.

"Some Factors Leading to Greater Production from a Steel Furnace," by A. Robinson.

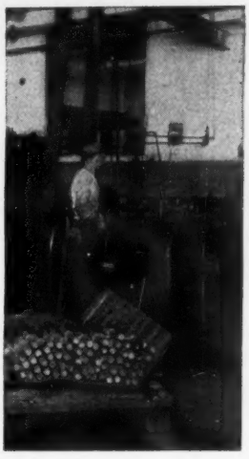
"The Effects of Pickling on the Properties of Carbon Steels," by I. G. Slater.

"A Note on the Effect of a Backward Pull Upon the Tension Required To Draw Wire," by F. C. Thompson.

"A Method for the Electrolytic Extraction of Slag from Iron and Carbon Steel," by R. Treje and C. Benedicks.

Blaw-Knox Co., Pittsburgh, has taken a contract for the complete brewhouse equipment for a new brewery for the Hoffman Beverage Co., Newark, N. J. The equipment will be of the latest design, with positive mechanical control of all operations and absolute sterility of every unit.

Making the Most of



METHODS AND MATERIALS

FURNACES of the bell type, with controlled atmosphere, are being used increasingly for annealing steel. The atmosphere may be obtained by burning city gas, natural gas or coke oven gas in ratios of two to three and a half volumes of air to one of gas. The mixture is aimed to get incomplete combustion so as not to carry an excess of oxygen. The result is an atmosphere which is practically nonoxidizing and, in fact, somewhat reducing. Care is taken to remove excess moisture by means of a condenser. In some cases, hot copper is employed as a purifier to absorb oxygen. Annealing in such a protective atmosphere keeps the steel bright and also removes surface oxide; as a matter of fact, the atmosphere is kept on the reducing side for the purpose of removing surface oxide. In a good many cases, it is found that atmospheres produced in the above manner are the most inexpensive protective atmospheres obtainable.

S S S

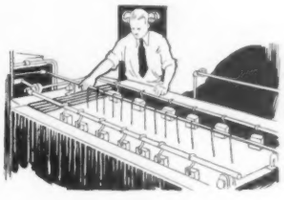
Malleable foundrymen have considered chromium as a source of trouble, but today up to 0.50 per cent is being used commercially in the manufacture of that class of castings. The effect of chromium in preventing the annealing operation is overcome by increasing silicon. A number of test bars containing 0.30 per cent chromium with 1.40 per cent silicon averaged about 80,000 pounds per square inch tensile strength with over 9 per cent elongation.

S S S

DUE TO the number of variables which affect the cost of hardfacing, it is not feasible to compile simple cost data which allow for all conditions. In average practice, however, labor and gas, or electric current, show no great difference from those consumed in conventional welding. Oxygen and acetylene consumptions range from approximately 12 to 20 cubic feet each per pound of hardfacing rod deposited, depending on the work. Acetylene requirements are somewhat more than oxygen, because of the carburizing flame required.

S S S

The electroplater frequently is asked as to the best thickness of hard chromium plating. In the case of precision parts which must be held very close to operate properly, a plate of 0.0002 to 0.0004-inch thick has frequently proved satisfactory and is being used. A plate as thin as this has the advantage that it can be held sufficiently even over a uniform section to finish by lapping alone. A plate 0.0001-inch thick on the side of slitting saws has materially lengthened the life of the saws. A plate 0.001-inch thick will resist the file and give a satisfactory life for the average job. If the part can be allowed to wear more than this before it must be replaced, it may



be economical to use a heavier plate. It must be remembered in this connection, however, that chromium like most other extremely hard materials is inherently brittle. Consequently, where localized pressures of high and rapidly varying intensity are likely to be met with, or where shock may be encountered, the heavier plate might fail by cracking before a thinner plate. In cases where the part is subjected to rapid or great changes in temperature, the difference in the coefficients of expansion between the chromium and base metal may cause a failure of heavier plate before that of a light plate.

S S S

Excessive pressure in an 8-inch centrifugal pump in an oil refinery had cracked the cast-iron head badly. The pump manufacturer declined to supply a separate head, stating that the bottom and top heads were machined at the same time and that a new head made independently of a new pump could not be guaranteed in efficiency. It seemed that it would be necessary to buy a new pump at a cost of about $350. At this point, bronze welding was suggested, was tried and proved successful. The job was accomplished and the pump reassembled at a total cost of about $50.

S S S

STEEL floats for trawler fishing nets are a new product of an English manufacturer who recently has been experimenting with these floats off the coast of Scandinavia. It is claimed that hollow steel floats have a much longer life than various other types which have a tendency to lose buoyancy through wear and continued saturation by sea water, despite frequent drying and baking processes. The manufacturer now is executing a number of orders for the new product.

S S S

The ordinary chromium plating in use today is only about 0.00003-inch thick and does not prevent rust. Rust protection can be obtained, however, by the use of heavy nonporous chromium coatings, though such coatings are too expensive for practical purposes. Chromium, therefore, is applied over thick coatings of nickel or copper and nickel, which furnish protection.

S S S

An automatic oxyacetylene cutting machine is used by a manufacturer of steam shovels and excavating machinery to cut large dipper teeth from chrome-vanadium steel billets. These teeth have overall dimensions of 5 feet 10 inches x 14½ inches x 7½ inches. For cutting this material, as for all alloy or high carbon steels, the billet is preheated to about 750 degrees Fahr. before cutting. Subsequent heat treatment of the cut part insures toughness and resistance to wear. Another advantage of the preheat is that it prevents development of unequal stresses in the part being cut, the action being one of compensating for or otherwise subordinating those stresses which ordinarily form behind the cutting operation. The preheating also effects a substantial saving of oxygen and acetylene.

STEEL SHOW ISSUE—SEPTEMBER 25, 1933

Information

General

The National Metal Congress (American Society for Steel Treating Exposition) will be held at the Convention Hall, Detroit, Mich., October 2-6. The following technical societies will participate:

American Society for Steel Treating

American Welding Society

Iron & Steel Division, A. I. M. & M. E.

Institute of Metals Division, A. I. M. & M. E.

Wire Association

Naturally, STEEL will play a prominent part in co-operating to make this Fifteenth Annual Metal Congress a success. The issue of September 25 will carry the complete advance details of the exposition and convention, and will be in the hands of readers a week before the convention opens—ample time to make plans.

This issue will bring the convention and exposition to those who cannot attend.

Publication

A feature of the September 25 issue of STEEL will be a combined editorial and advertising section devoted to the same interests as the National Metal Congress.

Those advertisers desirous of appealing to these same interests will find unusual value in being properly represented in the special section of this issue.

This interest value is not confined to the readers of STEEL who attend the Detroit Exposition, but extends in even larger measure to those similarly interested who do not attend, thereby depending more largely upon STEEL to bring the Exposition to them.

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COLOR

Two colors will be used—red and black—printed on India tint coated stock.

RATE

Including color and insert position—$150 a page for regular advertisers—$175 per page one time.

CLOSING DATES

Final forms close Wednesday, September 13. Reservation and copy requiring composition should be in Cleveland not later than Thursday, September 7.

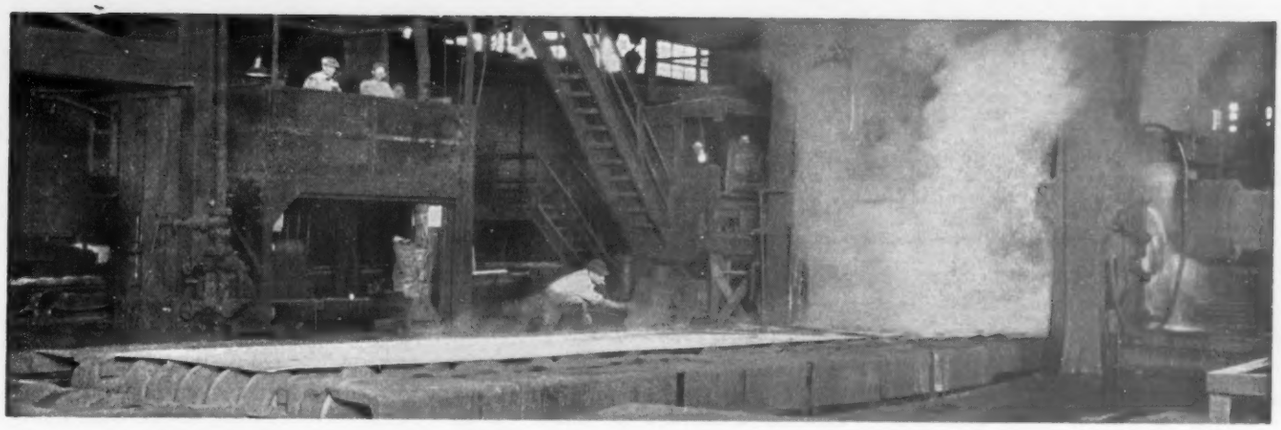
STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

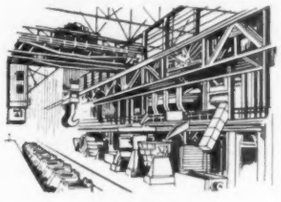
CLEVELAND

New York Pittsburgh Chicago Washington London



PROGRESS IN STEELMAKING

MILL wabblers and coupling boxes show higher resistance to wear when coated with chromium. The surface of the mold for making these parts is faced with powdered ferrochromium which is taken up by the molten steel during the pouring operation. The casting thus is provided with an alloy coated surface high in chromium.



OPERATING savings which result from the insulation of open-hearth furnaces range from 12 to 25 per cent, according to a steelworks executive. The saving is contingent upon whether the furnace previously was well sealed and controlled, in which event the lower figure would apply. Where the furnace was not well sealed against air infiltration, and draft and combustion control were treated lightly, then the maximum percentage previously mentioned can be expected.

♦ ♦ ♦

Increasing the yield of by-products has been accomplished at a by-product coke plant in the Pittsburgh district by using washed coal for coking. In addition, a reduction of 20 per cent in the quantity of hydrogen sulphide is effected.

♦ ♦ ♦

Bending plain and stainless steel tubing is facilitated by the use of a recently developed metal alloy filler. The alloy, which melts at 160 degrees Fahr., is poured into the tube and then chilled. The product forms a structure having a fine grain and prevents the tube from collapsing during the bending operation. Immersing the pipe in boiling water causes the alloy filler to melt, thus effecting easy removal.

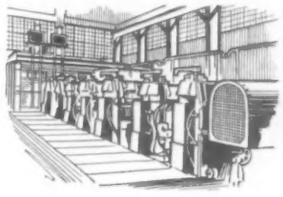
♦ ♦ ♦

Absence of vibration, increased accuracy in crowning, concaving and straight grinding, and minimized time involved in surface rolls are some of the features of a newly designed roll grinder for servicing the backup and work rolls of modern 4-high mills. The speed reduction from the motor to the roll being ground is obtained through four multiple V-belts, three of which are used simultaneously. A gear incorporated in a crowning device automatically eliminates backlash in the train of gears driving the crowning device eccentric, thus affording exact synchronism between the wheel carriage and wheel when crowning or concaving a roll.

IMPROVED electrical properties are claimed for a newly marketed magnet steel for use in permanent magnets and containing 35 per cent cobalt. The new steel is made by an English producer and is supplied either in hot rolled or cast form.

♦ ♦ ♦

Functions of burner pressure control, flow indication and measurement of volume at industrial gas heating furnaces now may be performed by a single unit recently marketed for this purpose. A remote controlled pressure regulator and single pen indicating orifice meter equipped with a square root chart are provided. Through a pressure tap directly to the burner manifold, the regulator maintains a constant pressure at the manifold, regardless of the number of burners on gas. A simplified orifice meter is provided with an indicating scale, over which the pen arm describes an arc and indicates the rate of flow expressed in cubic feet an hour. By glancing at the scale, the operator instantly can determine the consumption of gas.



DURING a three-month period, the power consumption of a 10-inch continuous rod mill was 112 kilowatt hours per ton of rods. The mill includes 10 finishing stands with rolls mounted in babbitt and bronze bearings and properly greased. By mounting the rolls of the last six finishing stands in lignum vitae bearings and lubricating them with water the average power consumption was reduced to 85 kilowatt hours per ton, based on a corresponding 3-month operating period. The starting load on the wooden bearings and on the babbitt and bronze bearings was in the ratio of 3200 to 3800 kilowatts but this further was reduced by swabbing the roll necks with oil just before stopping the mill to prevent the necks from rusting and to afford easy starting. The highest neck speed of the rolls operated in the composition bearings is 2150 feet a minute and the slowest neck speed, 163 feet a minute. Babbitt and bronze bearings in this mill afforded a rolling campaign of 4300 tons of rods, compared with a 54,000-ton campaign afforded by bearings of the lignum vitae type.

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

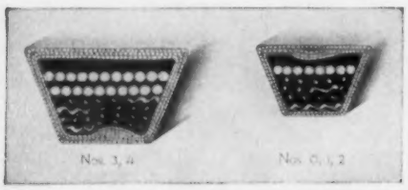
Welding Spectacle Affords More Eye Protection

Linde Air Products Co., 30 East Forty-second street, New York, has developed a new welding spectacle and lens mounted in a canvas bakelite frame. Increased width permits a wider range of vision and provides additional protection against light and sparks. The bows are covered with insulating material and the frame is nonflammable and does not conduct heat. By means of a snap device where the temples meet the frame it is possible to spread the frame and change the lens in a few seconds. The new type AA lens, flat ground and polished, is made in light, medium, dark green shades.

◆

New V-Belt Has High Power Capacity, Low Stretch

Worthington Pump & Machinery Corp., Harrison, N. J., recently introduced a new and improved type of V-belt, shown herewith. A basic feature of the belts is a greater concentration about the neutral axis of



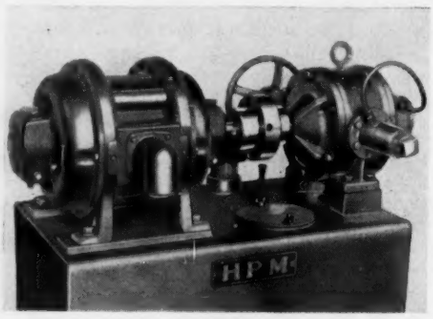
Worthington V-belt enclosed in fabric envelope

the belt, of the load carrying capacity. Sizes 0, 1 and 2 have one endless cord in one plane while sizes 3 and 4 have two endless cords in two planes. All cords are completely imbedded in rubber, thus affording full insulation for the control of internal heat. Tension and compression sections of the belt are composed of rubber, with layers of fabric distributed through the compression section.

◆

Designs Power Units for Hydraulic Drives

Hydraulic Press Mfg. Co., Mt. Gilead, O., recently introduced a line of standardized hydro-power units to facilitate the application of its new radial oil pressure pumps. Each unit, shown herewith, incorporates a radial pump pressure generator, direct driven from an electric motor through a flexible coupling. Both pump and motor are mounted on a base which is made of steel plate, formed and welded. This is enclosed completely so as to serve as a reservoir for the oil used as pressure fluid and lubricant. The reservoir is equipped with removable end cover, covered filling strainer, air vent filter, level gage and drain valve.



Hydro-power unit designed by Hydraulic Press Mfg. Co.

Pressure output of the pump is regulated by an automatic control which may be adjusted for any value within operating limits up to 3000 pounds per square inch.

◆

Unit Controls Temperature in Industrial Processes

Automatic Temperature Control Co. Inc., 34 East Logan street, Philadelphia, has developed a new controller unit, shown herewith, known as type 305. The device is intended for service such as that required by a continuous heat treating furnace located in a production line and subject to changes in rate of flow of work treated. The new device is designed to be actuated by an instrument having five separate contacts, two either side of the normal setting, or equivalent. Through a simple limit switch arrangement, each intermediate contact between extreme low and extreme high contact in the actuating instrument has two definite valve positions so that on making one of these contacts, following a drop in temperature, the valve opening and hence the resultant fuel supply is greater than when the same contact is made following a rise in temperature.

◆

New Spray Gun Has Many Exclusive Features

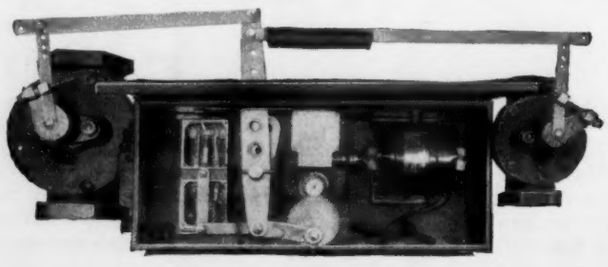
DeVilbiss Co., Toledo, O., is marketing a spray gun which embodies a new type air trigger and an unrestricted passage to give better atomization. The improved ball and cone principle has been employed which assures proper concentricity of the fluid tip and air cap. Clearly indicated graduations allow the operator to control the width and character of the spray. Body of the gun is a heat treated aluminum alloy forging. Spray head can be furnished either in brass or aluminum.

◆

Introduces Precision Level For Shop Use

R. Y. Ferner Co., Investment building, Washington, as American agents for Societe Genevoise d'Instruments de Physique, is placing on the market a high precision level, reading 5 seconds of arc per division.

It is adapted particularly to shop use for checking machine tools and high speed transmissions, setting sine bars on inclined surfaces, leveling base plates and beds of machinery and for manufacturing all types of tools and fixtures.



ATC motor-operated multi-position controller. With this system it is possible to assure a fuel supply more consistent with fuel demand

Rate Off 3 Points; Code Prices Being Filed

Pig Iron Up $1 in Eastern Districts—Advances Impending in Light Finished Products — Seasonal Lull in All Lines More Apparent

STEEL consumption continues to decline, a further reduction of 3 points in the steelworks rate to 48 per cent accurately gaging the downward trend during the past week.

With seasonal influences operating in practically all consuming fields, the market still lacking the stimulus of higher prices, and the government's public works program maturing with disappointing slowness, it appears this trend will extend into September. Sometime in that month the downward swing is expected to collide with a general rise in prices, which steelmakers hope will arrest the decline.

Uncertainties over the NRA's effect on the steel industry are being dissipated. Steelmakers are filing prices which will apply under their code for the remainder of this quarter. It is indicated that on many heavy finished steel products no changes will be made from present official levels, though advances are impending in some of the lighter products.

Mill specifications are diminishing rapidly, and for some of the leading producers new orders so far in August are only 25 to 50 per cent of the tonnage in the comparable period in July. Meanwhile, stocks are being reduced; another hopeful indication for an early revival in buying. In tin plate, releases already in hand for October insure a continuation of mill operations near 95 per cent.

In heavy finished steel, the outstanding new project of the week is an 800-mile pipe line from the mid-continent field to Chicago, plans being formulated by a group of independent oil producers, which will require 75,000 to 100,000 tons of steel. Railmakers are confident of a substantial demand by November, and expect the eight months following will be a period of expanding railroad activity. Fruit Growers Express, New York, is in the market for 673 underframes, requiring 3300 tons of steel.

Construction projects requiring thousands of tons of steel in many cities are being held up pending efforts to obtain federal loans. In some important instances, however, it is announced the projects will proceed eventually regardless of whether loans are obtained. Structural awards for the week, 4022 tons, also reflect the delay in numerous federal projects.

The first price increase in raw material for immediate effect and application under the code is $1 a ton on pig iron in all eastern districts, likely to be followed by producers in southern and other markets. Pig iron and foundry coke shipments are setting a new high record for the year, and though the increase in merchant iron demand in the Ohio-Michigan territory is reflected in the lighting of another Toledo blast furnace, the decline in steel requirements has led to the banking of four Carnegie stacks.

Responsive to increased buying, foundry coke is up 50 cents a ton in some districts. Scrap is quieter, and at Pittsburgh prices are easier. Republic Steel Corp. is reopening some of its Alabama iron ore mines idle seven years.

Iron and steel exports for July dropped 14,270 gross tons to 88,311 tons, while imports increased 18,437 tons to 52,805 tons. For the seven months this year exports, 615,579 tons, compared with 374,287 tons last year; and imports are 205,283 tons, against 227,491 tons.

The decline in the national steelworks average to 48 per cent wipes out all the gain since the second week in June. The rate is down 5 points to 72 per cent at Cleveland; 7 points to 53 at Youngstown; 12 to 41 at Buffalo; 3 to 43 at Pittsburgh; 1½ to 39 in eastern Pennsylvania. In New England it advanced 2 points to 85.

STEEL's iron and steel composite is up 8 cents to $30.10; finished steel composite holds at $47.50, while the scrap composite is up 4 cents to $11.58 on an adjustment on compressed scrap at Pittsburgh.

Composite Market Averages

	Aug. 26	Aug. 19	One Month Ago July, 1933	Three Months Ago May, 1933	One Year Ago Aug., 1932	Ten Years Ago Aug., 1923
Iron and Steel Composite	$30.10	$30.02	$29.81	$28.45	$29.32	$44.87
Finished Steel Composite	47.50	47.50	47.20	45.10	47.46	68.33
Steelwork Scrap Composite	11.58	11.54	10.66	9.23	6.25	15.90

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Cnrrent Week; Average for Last Month, Three Months and One Year Ago

	Aug. 26, 1933	July 1933	May 1933	Aug. 1932
Pig Iron				
Bessemer, del. Pittsburgh	18.26	17.86	16.66	15.76
Basic, valley	16.00	15.60	14.40	14.00
Basic, eastern, del. eastern Pa.	18.19	16.79	15.44	13.85
No. 2 foundry, del. Pittsburgh	17.76	17.36	16.16	15.76
No. 2 foundry, Chicago	17.00	16.75	15.90	15.50
*Southern No. 2, Birmingham	13.00	12.60	12.00	11.00
**No. 2X Virginia furnace	18.75	17.75	17.75	17.81
**No. 2X, Eastern, del. Phila.	18.63	17.28	15.95	14.38
Malleable, valley	16.50	16.10	14.90	14.50
Malleable, Chicago	17.00	16.75	15.90	15.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	17.13	16.93	16.03	15.63
Ferromanganese, del. Pittsburgh	87.24	84.44	73.24	73.24

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	2.50	2.40	1.75	2.00
Connellsville, foundry, ovens	3.00	2.85	2.25	2.90
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Aug. 26, 1933	July 1933	May 1933	Aug. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.65	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.81½	1.65	1.65	1.75
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.50	1.60
Tank plates, Philadelphia	1.79½	1.49½	1.49½	1.79½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.65	1.75	1.55	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.00	2.15
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.70	2.80
Sheets, No. 10 blue anneal., Chi.	1.95	1.95	1.75	1.85
Sheets, No. 24 hot ann., Chicago	2.40	2.40	2.20	2.35
Sheets, No. 24 galvan., Chicago	3.00	3.00	2.85	3.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.05	1.85	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$13.75	12.70	11.65	8.55
Heavy melting steel, eastern Pa.	12.00	10.55	9.00	6.37½
Heavy melting steel, Chicago	10.25	10.45	8.70	5.40
No. 1 wrought, eastern Pa.	13.00	11.60	10.25	6.25
No. 1 wrought, Chicago	10.35	10.20	8.10	4.50
Rails for rolling, Chicago	11.25	11.15	10.25	6.50

Sheets

Some Good Orders for Automotive Sheets Placed at Pittsburgh —General Market Is Quieter

SHEET PRICES, PAGE 53

Pittsburgh—Several attractive orders for wide autobody sheets were in the market last week, representing some unexpected specifications from motorcar makers. Improvement in the fall season is forecast for galvanized sheets in rural districts. Black sheets are in light demand, although some specialties, such as electrical and furniture sheets, have improved over the past week to ten days. The schedule of sheet prices is steady on most grades, irregularities being confined to autobody sheets.

Cleveland—New buying is more conservative, mill operations being sustained mainly by specifications on contracts. In Cleveland during the week sheet mill operations held at about 60 per cent; a nearby lake interest had a full schedule for last week, and this week. The movement of sheets to automotive interests is slackening, and heavy purchasing by the industry is not yet in definite prospect. In miscellaneous lines, washing machine manufacture is most active, as represented by current orders. Shipments to refrigerator interests continue heavy, but new business is quiet. Sheetmakers are compiling their prices to be filed with the Iron and Steel institute code committee; little change from current open market levels is expected.

Chicago—Sheet mill backlogs are declining as production continues to exceed incoming business. Orders the past week dropped further and while some recovery is expected to follow announcement of prices under the steel code the peak in buying is seen as passed for the present. Automotive shipments are well maintained to some interests but are tending downward as a whole, with a further drop looked for in September. Shipments to beer barrel manufacturers continue heavy while farm implement needs are light.

Inland Steel Co. is low on 195 tons of cold-rolled sheets for the Mare Island, Calif., navy yard at $13,977.36, delivered; bids Aug. 22.

Cincinnati—Sheet mills continue production near 70 per cent. Automotive demand has slackened. Volume for varied industrial uses has approached the July average.

Boston—Pressure for sheet deliveries has eased. Whether base prices to be filed immediately by mills under the steel code will continue through the fourth quarter is a matter of conjecture. If not, an unusual spurt in buying in September is likely.

New York—Bids went in Aug. 24 on the previously noted inquiry for 43,000 tons of galvanized sheets for the Argentine government. Producers in other countries were also asked to bid. Miscellaneous buying is dull with specifications against old contracts holding fairly well.

A leading eastern refrigerator manufacturer has reduced his operating schedules. Grimm Stamp & Badge Co., St. Louis, is low on 1934 Tennessee vehicle license plates, taking close to 650 tons of sheets.

Philadelphia—Sheet specifications are beginning to taper off, with new inquiry quiet. Most of the leading consumers are covered for the remainder of this quarter. The decline in specifications has enabled some producers now to catch up fully on their schedules.

St. Louis—Automotive sheet requirements have receded, and are not expected to revive until about the middle of September. The market for sheets in general is quieter.

Birmingham, Ala.—Shipments are active, and all mills are in operation. Agricultural sections are not taking as much material as usual, though inquiries are noticeable.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surchage corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.65c
Chi. dist. mills	1.75c
Chicago, del.	1.80c
New York, del.	2.00c
Birm., base	1.80c
Phila., del.	1.96c
St. Louis, del.	1.84c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.80c
Chi. dist. mills	1.90c
Chicago, del.	1.95c
Phila., del.	2.11c
New York, del.	2.15c
St. Louis, del.	1.99c
Birm., base	1.95c
San Fran., c.i.f.	2.27½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.25c
Chi., dist. mills	2.35c
Chicago, del.	2.40c
New York, del.	2.60c
Phila., del.	2.56c
Birm., base	2.40c
St. Louis, del.	2.59c
San Fran., c.i.f.	2.90c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Chi. dist. mills	2.95c
Chicago, del.	3.00c
Phila., del.	3.16c
New York, del.	3.20c
Birm., base	3.00c
St. Louis, del.	3.19c
San Fran., c.i.f.	3.50c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.84c

MILL RUN COLD-ROLLED No. 10

Pittsburgh, base	1.95c
Chicago, del.	2.10c
Philadelphia, del.	2.26c
New York, del.	2.30c

No. 20

Pittsburgh, base	2.40c
Chicago, del.	2.55c
Philadelphia, del.	2.71c
New York, del.	2.75c

AUTO. AND FURNITURE

Pittsburgh, No. 10	2.15c
Pittsburgh, No. 20	2.60c

ENAMELING SHEETS

Pitts., No. 10	2.40c to 2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.25
Do., stock	3.75
Long ternes, No. 24 unassorted	2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.60c
New York del.	1.90c
Phila., del.	1.79½c
Boston, del.	2.02c
Buffalo, del.	1.85½c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Birmingham, base	1.75c
Coatesville, base	1.70c
Sparrows Point, base	1.70c
*Pac. Coast, c.i.f.	2.10c
St. Louis, del.	1.94c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.81½c
New York, del	1.87c
Boston, del.	2.00½c
Bethlehem base	1.70c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Lackawan., base	1.70c
Birmingham, base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, base	1.75c
Lackawan., base	1.70c
Pacific Coast ports, c.i.f.	2.10c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.95c
Pitts., forg. qual.	1.75 and 1.85c

RAIL STEEL

Pitts., Buff.	1.50c
Chicago, base	1.50c
Eastern mills	1.50c

IRON

Chicago, base	1.60c to 1.70c
Philadelphia, base	1.60c
Pitts., refined	2.70c to 4.20c

REINFORCING

New billet steel, Chi., Pitts., Buff., Cleve., Birm. (cut lengths)	1.75c
Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher; joint carloads up 20 cents; less carloads up 30 cents. Nail extras subject to 10 per cent discount on straight or mixed carload shiped to single consignee.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00

(To Manufacturing Trade)

Plain wire, 6-9 ga	2.10c

Anderson, Ind., and Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Spring wire	3.10c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs	1.90c
60,000 to 99,999 lbs	1.85c
100,000 lbs. and over	1.82½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Shafting

(Turned and ground)
Cumberland, Md., base

1⅛-inch	3.25c
1⅛ to 1½-inch	2.75c
1⅝ to 1⅞-inch	2.60c
1 15/16 to 2⅞-inch	2.45c
2 15/16 to 6-inch	2.30c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	0.20
6100 bars	1.20
6100 spring	0.95
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 (flats)	0.25
9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.65c
Do., Chicago	1.75c
Do., del. Phila.	2.01c to 2.06c
Do., del. N. Y.	2.05c to 2.10c
Cooperage hoop, Pittsburgh	1.75c
Do., Chicago	1.85c
Cold-rolled strip Pitts., Cleve.	2.25c
Worcester, 3 tons or over	2.45c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$23.00
50 to 75	$20.00
80 to 100	$23.00 to 24.00
Light rails, 25-45, mills	$30.00
Light rails, Chi.	$32.00
Angle bars, mills	2.55c
Spikes, boat, Pitts.	2.65c
Track bolts, base	3.40c
Tie plates, Pitts.	1.90c
Tie plates, Chi.	1.90c

Base, railroad spikes 200 kegs or more; base tie plates, 20 tons or more; differentials for less.

Rivets, Wrought Washers

Struc. c.l., Pitts-Cleve.	2.50c
Struc., c.l., Chi.	2.60c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 5 off
Washers, c.l., Pitts. dist.	7.35 off
Do., Chi. dist.	7.00 to 6.75 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread, ½ x 6 and smaller	73 off
Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	73 off
Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller, 73 off.	

NUTS

Semifinished	73 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

*Cut nails, Pitts.; (10% discount on size extras)	$2.75
*Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
*Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pitts.	1.90c
Steel piling, Buff.	2.00c
Steel piling, Chi.	2.05c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
11 and 12	66	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

(Please turn to next page)

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932, except Buffalo del. at Boston. Asterisk denotes price change.

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing discounts apply.)

Hot Rolled

2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	40%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in. Chicago	46.40-47.40
6 to 24-in. Chicago	43.40-44.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 over Class B. Stand. fitgs., Birm. base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

Chicago, furnace	$17.00
Pitts., dist. fur.	17.00
Pittsburgh, del.	17.63-18.13
Valley furnace	16.50
Cleve. fur., loc. del.	16.50
*Philadelphia, del.	18.26
*Everett, Mass., fur.	18.00
Granite City, Ill.	17.00
St. Louis, del.	17.85
*Buff., fur. loc. del.	17.50
*Buffalo, del. Bost.	19.50
*Buff., del. Brook.	19.77
*Buff., del. Newark	18.89
Ala., Birmingham.	13.00
Ala., del. Chicago.	17.16
Ala., del. St. Louis.	17.35
Ala., del. Cincinnati	17.51
*Ala., Phila., dock.	19.12-19.37
*Ala., Balt., dock del.	19.12
*Ala., N. Y. dock.	19.62
*Ala., Bost. dock del	19.62-19.87
Tenn., Bir. base	14.00
Tenn., del. Cinci.	17.51
Montreal, del	22.00
*Eastern, del. Phil.	18.76

FOUNDRY NO. 2X

*Buff. fur., loc. del.	18.50
*Buff., del. Brook.	20.02-20.27
*Do., Newark	19.14-19.39
*Buffalo, del. Bost.	19.75-20.00
*Eastern, del. Phil.	18.51-18.76

FOUNDRY NO. 1X

*Buf., fur., local del.	18.50
*Eastern, del. Phil.	19.01-19.26
*Buff., del. Brook.	20.52-20.77
*Buff., del. Newark	19.64-19.89

MALLEABLE

Valley furnace	16.50
Cleve. fur., loc. del.	16.50
Pittsburgh dis. fur.	17.00
Pittsburgh, del.	17.63-18.13
Chicago, furnace	17.00
*Buf., fur., loc. del.	18.00
*Eastern Pa., del.	19.13-20.91
Granite City, fur.	17.50
Montreal del.	22.50
Toronto, delivered	21.00

BASIC

Pitts., dist. fur.	16.50
Pittsburgh, del.	17.13-17.63
*Eastern Pa., del.	18.00-18.25
*Buf., fur., loc. del.	17.50-18.00
Montreal, del.	22.00
Valley, furnace	16.00

BESSEMER

Valley furnace	17.00
Pittsburgh fur.	17.50
Pittsburgh, del.	18.13-18.63

LOW PHOS.

Valley fur. stand.	25.00
*Standard, del. Phil.	23.13
*Copper, bear. E. Pa. furnace	22.00

GRAY FORGE

Valley furnace	16.25
Pitts., dist. fur.	16.50
Pittsburgh, del.	17.13-17.63

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

Jackson County, O., base: 6%—$21.25; 7—$22.25; 8—$23.25; 9—$24.25; 10—$25.25; 11—$26.75.

BESSEMER FERROSILICON

Jackson County, O., base: 10%—$26.25; 11—$27.75; 12—$29.25; 13—$30.75; 14—$32.25; 15—$33.75; 16—$35.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50
No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish lo wphos.	8.50
Spanish, No. Afr. basic, 50 to 60%.	7.00
Tungsten, spot, sh. ton unit, duty pd.	$12.00-12.50
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%.	21.00-22.00
So. Afr., 49-51%.	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago	54.00
Birmingham, Ala.	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.c.b. ship. point	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 to 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$14.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts.	1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

*Connellsville fur.	$2.50- 2.75
*Connellsville fdry.	3.00- 3.25
Connell. prem. fdry.	4.50
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del,	7.50
Chicago, del.	8.25
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.50
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.00
Portsmouth, ovens, Connel. basis	5.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent. Spot, $5 a ton higher.	120-130.00
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do. spot del.	10.00
Ferrotungsten, stand., lb. cont.	1.04 -1.10
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.50 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity.

Bars

Sales at Lower Rate But Shipments Heavy as Backlogs Press for Delivery

BAR PRICES, PAGE 53

Pittsburgh—Demand for soft steel bars dropped noticeably last week and where bar mills in this district have been active it has been on orders booked in June and July. The open-hearth department of a leading bar producer here which had 18 open hearths on ten days ago and which was down most of last week, resumed with six open hearths late last week. The market continues generally 1.60c, Pittsburgh, pending definite confirmation under the steel code.

Cleveland—Commercial steel bar prices are likely to remain 1.65c, base, Cleveland, for the remainder of the quarter in the schedule to be filed under the steel code. Anticipation of a higher level for fourth quarter is expected to develop more purchasing in September. New bookings so far this month average around 50 per cent of the tonnage in the comparable period last month. Shipments on contracts, however, are fairly active.

Chicago—Steel bar sales and specifications continue to decline, signing of the steel code so far having little effect on new business. Shipments are well maintained, still being supported by backlogs, but the trend in automotive requirements is downward and a quieter market is seen for September. Announcement of fourth quarter prices within the next few days is awaited with interest because of its probable effect on buying. While the question of the differential between Chicago and Pittsburgh bases still pends a compromise between parity and a $2 a ton spread is looked for by some. Bar demand from farm implement manufacturers and railroads are light. Bar iron is moving well to frog and switch manufacturers and is in fair demand for building of some farm equipment.

Boston—Bid of 4.31c, delivered, was submitted by all but one bidder on 74,000 pounds of hot-rolled round grade V steel bars, 1⅛-inch diameter, for the Charleston navy yard for manufacture of die-lock chain. Demand for commercial steel bars is unchanged with little advance buying, although a price advance later is considered likely.

New York—No change is expected in the current quotations on steel bars for third quarter but a possible advance of $3 for fourth quarter is forecast.

Philadelphia—A fair tonnage of commercial steel bars was placed here last week at 1.60c, Pittsburgh, plus the 31-cent carload rate from that point. Most consumers, however, are well covered for the remainder of the quarter.

Tin Plate Releases for October In; Mill Rate High

Tin Plate Prices, Page 53

Pittsburgh — Capacity operations continue in some tin mills in this district, and the average is over 95 per cent. Canmakers' specifications for October shipment were in the market last week, thereby allowing the tin plate producers the usual 45 days for production, processing and shipment of plate. Producers are quoting $4.25 per base box, and while this price may be filed under the steel code it may be changed soon in view of the usual October contract negotiations with canmakers for the ensuing year.

Cold-Finished Quieter, But Price Holds Firmly

Cold Finished Prices, Page 53

Pittsburgh—August cold-finished steel bar specifications are less than for July and forecast smaller shipments in September. August shipments, on the other hand, were ahead of those in July. The market on cold-finished bars at 1.95c has been tested since the Aug. 1 advance and probably the present base will be filed as the market for the next 90 days under the steel code.

Plates

Fair Volume Moving but Dull Condition Rules — Price Not Determined Under Code

PLATE PRICES, PAGE 53

Pittsburgh—Plate producers have been considering the Pittsburgh base which they will file under the steel code and in all probability 1.60c base, Pittsburgh, will be the market. Bids were opened Aug. 23 by Pittsburgh for a tank to be built on the Southside and Pittsburgh-Des Moines Steel Co. was awarded the contract at $37,995. The tank, 100 feet in diameter by 53 feet high, requires 370 tons of plates. Etna, Pa., a suburb of Pittsburgh, will close bids Sept. 1 on a 630,000-gallon steel standpipe. Between 40 and 50 tons of plates will be required.

Cleveland—Plate sellers have been accepting orders recently with a reservation that they might increase the price before shipment if deemed justified under the steel code. Though 1.60c, base, Pittsburgh, is the general price, producers point out they are not committed to this for the remainder of the quarter. On an inquiry for 400 to 500 tons of plates last week one mill quoted 1.65c. The Cleveland plate mill is operating at about 40 per cent. The city is delaying signing general contracts for watermains which require 5000 tons of plates, pending efforts to obtain an R. F. C. loan. Bids will be taken Sept. 7 on tanks for a Cleveland disposal plant, requiring 700 tons of plates. Bids went in at Washington last week on 1000 tons for vaults for the federal reserve bank there.

Chicago—A fair volume of plate business continues to come from the brewery equipment field and oil companies continue light buyers. Appearance of new pipe line projects, though still in the tentative stage, aids the outlook for heavier plate demand. Railroad needs still are confined principally to repair work and tonnage involved is light.

Boston — Except inquiry for bridges, activity in plates is light with orders fewer, covering small tonnages. Tank work for a brewery at Lowell, Mass., takes a fair tonnage. The 1.70c, Coatesville, Pa., price has been firmly held.

New York—Plate prices are expected to show no change from present quotations when filed with the American Iron and Steel institute under the steel code, for third quarter but may be advanced $3 for fourth quarter. Trading is quiet.

Philadelphia—In the experience of some producers plate specifications so far this month have exceeded those for the corresponding period of July. New buying is light. Railroad buying is slowing up, with some sellers not expecting improvement in this direction until late next month.

St. Louis—Anheuser-Busch Inc.,

the largest local brewery, contemplates a further expenditure of $1,500,000 for boilers, tanks and other plant equipment. It will build tanks calling for 100 to 400 tons of plates immediately. The exact tonnage is not known as plans have not been completed.

Contracts Placed

1200 tons, mostly plates, four drum gates, Panama, to Virginia Bridge & Iron Co., Roanoke, Va., $137,800. Lake Erie Engineering Corp. Buffalo, awarded 84-inch needle valves, $29,500. Thomas Spacing Machine Co., Pittsburgh, awarded drum gate controls and semiautomatic gate hangers, $4760 and $7524. Bids Aug. 15.

370 tons, steel water tank for City of Pittsburgh, at Grandview park, South Side to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, at $37,995.

360 tons, ship repair jobs, to Todd Dry Docks Inc., Seattle.

100 tons, pipe line for Los Angeles, to Southern Pipe & Casing Co., Los Angeles.

100 tons, 13 tanks, Los Angeles, to unnamed interest.

100 tons, tank, McPherson Kans., to R. D. Cole Mfg. Co., Newman, Ga.

Contracts Pending

5200 tons, Pine Canyon dam pipe line, Pasadena, Calif., Consolidated Steel Corp., Los Angeles, low.

439 tons, including 13 tons floor plates, Panama, schedule 2895; bids Sept. 1. Part of material is for manufacture of shore pipe. Schedule also includes additional 68 tons, angles, channels and I-beams.

Railroads

Buyers Are Marking Time; Underframe Order Pending

Track Material Prices, Page 53

Railroads, like most other steel consumers, are marking time in the matter of purchases and new business recently has been light. Rail orders gradually are being filled and producers are confident that new buying will appear in fairly substantial volume by fall. Prospects for equipment orders remain uncertain, but it is pointed out that were such buying to appear the benefit to mills would be deferred as much as 60 days. Railroads have built up stores moderately during the past few months, current demand being principally for prompt needs. Outstanding in equipment inquiry is one from the Fruit Growers Express, New York, for 673 car underframes, requiring 3300 tons of steel. Orders for repair parts for cars and locomotives are slow to increase further, following a fair gain previously.

New York, New Haven & Hartford has placed 100,000 rail anchors.

Car Orders Pending

Fruit Growers Express, New York, 673 car underframes requiring 3300 tons of steel.

Strip

Mills Reducing Backlogs; Higher Prices Expected

Strip Prices, Page 53

Pittsburgh—Mill operations on strip steel continue close to 50 per cent of capacity but rolling schedules are catching up on orders. Mills are able to promise earlier deliveries as new business has been showing a declining trend through August. Deliveries are expected to be completed by the second week in September on all lower-priced material. The present asking market on spot business is 1.65c on hot strip and 2.25c on cold strip. Unconfirmed report is heard that a base of 2.75c on cold strip and 1.75c on hot strip may be filed under the steel code.

Cleveland—New strip orders are of a miscellaneous character and the volume is off considerably. In contrast to this situation, however, shipments continue heavy, mainly to the automotive industry. Producers with sheet and strip mills report better operations in their strip department than in sheets; for one reason, that strip capacity is less than for sheets. One important producer's sheet mills were idle last week, while its strip department was working full schedule, for rush shipments. Cold-rolled strip is firm at 2.25c, base, Cleveland; hot-rolled, 1.65c, Pittsburgh.

Boston—Cold-rolled strip mills are working off low-priced contracts and have taken some business for the remainder of third quarter at 2.45c, Worcester. Buying beyond this period has not appeared. Operations are tapering slightly. There has been little new buying of hot-rolled strip.

Chicago—With strip orders decreasing, backlogs are being reduced by fairly heavy shipments. Automotive requirements show considerable resistance to seasonal influences but are declining in some directions. Further moderation is expected for September. Announcement of future prices is hoped to correct some of recent hesitancy in buying.

New York—While there is little new tonnage, hot-rolled strip specifications are moving well, particularly to cold rollers, who in some instances have been operating 24 hours a day.

Philadelphia—While specifications are slower, most sellers report mills are fairly well scheduled for the next few weeks. Radio manufacturers continue among the leading consumers.

Wire

Sales Are Holding Well; Prices Retain Strength

Wire Prices, Page 53

Pittsburgh—Shipments have been under way since Aug. 15, and are rapidly being completed, on wire and nail business at lower than the present schedule. New orders through August were under those of July for all producers. Wire mill operations continue at 60 to 70 per cent of capacity. Good prospects are held for fencing over the next 60 days. The base on plain wire is 2.10c, Pittsburgh, while nails are quoted $2.10 per keg. Cut nails have been advanced 10 cents per 100 pounds.

Cleveland—Demand for wire and wire products is holding up much better than anticipated, leading makers still being two to three weeks behind on deliveries of some products. These makers appear confident of an early fall revival in general manufacturing lines. Most of them are committed at 2.10c for plain wire and rails for the remainder of this quarter, and changes are not likely to be made under the NRA program at least before the fourth quarter.

Chicago—Wire orders continue to moderate, with shipments holding fairly well but lighter than a month ago. Needs of some manufacturers wire consumers are declining, automotive use being less while jobbers are taking material in fair volume. Demand from farm districts is not expected to improve materially before fall. The market recently has continued steady at $2.15 for wire nails and 2.15c for plain wire.

Boston—Wire mill operations hold up well. There has been some encouraging buying at firm prices, notably specialties.

Philadelphia—Sellers of wire products expect improvement in buying next month. For the present most jobbers are covered but the move-

ment from stock has been fairly good this summer and jobbers, as well as manufacturing consumers may become active in September on requirements for last quarter.

Here and There In Industry

SUPERIOR STEEL CORP., Pittsburgh, in marking 1933 as its fortieth anniversary, is observing the date of its founding, 1893, as the Superior Steel Co. The company was incorporated in Virginia in 1916. Its Carnegie, Pa., works producing hot and cold-rolled strip steel of all analyses, was built in 1892 and first put in operation, Jan. 3, 1893. The company's annual capacity is rated at 120,000 tons of hot-rolled strip and 60,000 tons of cold-rolled, including rust-resisting and stainless quality. Present officers are: Frank R. Frost, president; John E. Wetzel, vice president in charge of sales; W. P. Ewing, assistant sales manager; Paul C. Jennings, treasurer; and C. D. Claney, secretary. At the Carnegie, Pa., works, David Pryde is works manager, and A. D. Feeman purchasing agent.

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Tungsten Production Co., Boulder, Colo., J. G. Clark president, has shipped 40 tons of tungsten concentrates, the first for some time. The shipment is valued at about $20,000.

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Machinery and Allied Products institute, recently formed, has opened an office at 2 West Forty-fifth street, New York, in charge of M. J. Reed. John W. O'Leary, Chicago, is head of the organization.

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Sampson-White Laboratories has been formed by E. G. Sampson and Wilfred H. White, Jamestown, N. Y., with offices in the Malleable Products Co. building. The firm will do general analysis of metals and alloys and general laboratory work.

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Durabilt Steel Locker Co., Aurora, Ill., has designed an overhead door for garages and similar use, fabricated entirely of steel, with resulting fire-resisting advantages and durability. Safety features are included.

□ □ □

Summit Stoves Inc., Geneva, N. Y., recently incorporated with $200,000 capital, has taken over the plant of the former Summit Foundry Co., in receivership. Earl C. Staley and Willard S. Kidney are interested in the company. Sufficient business is said to be on books to assure operations for the remainder of the year.

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Mills Co., Cleveland, has appointed the Building Products Corp., 1425 Welton street, Denver, George A. Wright, president, its sales representative for Colorado for its lines of metal partitions.

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Bonney-Floyd Co., Columbus, O., is installing a Lectromelt furnace for the manufacture of alloy steel castings and high-strength iron. This is the third furnace of this make installed by this company.

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Erie City Iron Works, Erie, Pa., has appointed Harry A. Pillen, 622 Broadway, Cincinnati, its district sales agent in the Cincinnati district.

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Coppus Engineering Corp., Worcester, Mass., has appointed John O. Weber, 122 Main street, Louisville, Ky., its representative for Kentucky, except counties served from its Cincinnati office.

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Allsteel Press Co., 12015 South Peoria street, Chicago, manufacturer of punch presses and sheet metalworking machinery, has appointed E. H. Merrick, Cook building, Cleveland, its exclusive representative for that territory.

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Eichleay Engineering Corp., Pittsburgh, has received a subcontract from the Babcock & Wilcox Corp., for the placing of pipe in tunnels at the Boulder dam in the West.

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Superior Steel Corp., Pittsburgh, has moved its Philadelphia office from 1904 Fidelity-Philadelphia Trust building to 2002 Girard Trust building, Philadelphia.

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Roots - Connersville - Wilbraham, Connersville, Ind., manufacturer of blowers, pumps and allied products, has appointed Leo I. Smith, 45 Gorham road, Belmont, Mass., its district representative for New England.

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Weiman & Ward Co., representing the Pleasant Valley Mining Co. in the sale of coal and coke in the Pittsburgh district, has moved from 836 to 943 Oliver building, Pittsburgh.

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Sheet metal and metalworking machinery of the John Van Co., Thirty-first and Robertson road, Oakley, Cincinnati, is being liquidated. Equipment includes 14 punches and shears, ten drill presses, several lathes, grinders and band saws, in addition to buffing and polishing tools, welding machines and miscellaneous equipment.

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Structural Shapes

Awards Shrink, with Action On Many Federal Projects Delayed — 10,000 Tons Needed for Mississippi River Work—Bids To Be Taken on 15,000 Tons at Buffalo

STRUCTURAL SHAPE PRICES, PAGE 53

Pittsburgh—Inquiry is improving but contracts are slower. West Virginia has asked bids on 1400 tons for state bridges. Bids on several western Pennsylvania postoffices have been postponed. About 1500 tons of shapes will be required by the United States department of agriculture for lookout towers. Pending consideration of the price on plain material to be filed under the steel code, the market on shapes remains generally 1.60c, Pittsburgh. Steel piling is unchanged at 1.90c, Pittsburgh.

Cleveland—An award of 642 tons for five beams spans for the Erie railroad at Elmira, N. Y., features the structural market. Another of 220 tons for one more Erie span at Elmira is expected this week. Other miscellaneous awards are small, with plain material steady at 1.60c, base, Pittsburgh.

Chicago—Structural inquiries and awards are in about their previous volumes. Private work is slow to increase while public projects on which bids are being asked take small lots. Action on upper Mississippi river improvemtnt work, requiring more than 10,000 tons of piling and shapes, is expected to start soon.

Boston—Inquiry, except for bridge construction, continues slack and district fabricating shops have little work booked. The outlook, however, is for a heavier tonnage of structural steel demand during the last quarter.

New York—Slightly more structural steel is pending, but awards to fabricating shops are light. Frederick Snare Corp. is low bidder for the bascule bridges at Jones Beach Parkway here, 1000 tons. The bulk of other active tonnage is for state bridges and hospitals. Some bids submitted last week for federal work in the East were returned unopened.

Buffalo—A temporary lull is noted in structural steel demand. Specifications for the Grand Island bridges here requiring 15,000 tons of steel may be ready for bids by Sept. 15.

Philadelphia—Placing of 250 tons for bridge work in Montgomery county, Pennsylvania, is outstanding in a light market. New inquiry is negligible. An apartment here, for which government aid has just been granted, will require approximately 1500 tons of shapes. Heavy storms have resulted in a large damage to property, with a result that demand for sheet piling may receive considerable impetus.

Contracts Placed

1000 tons, Missouri river bridge near Kansas City, to Kansas City Bridge Co., Kansas City, Mo.

642 tons, five beam spans, Erie railroad, Elmira, N. Y., to American Bridge Co., Pittsburgh.

375 tons, 250 for county bridges Nos. 240 and 265, Montgomery county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.; 75 tons for county bridge No. 233, to McClintic-Marshall Corp., Bethlehem, Pa.

350 tons, postoffice, Cambridge, Mass., to Lehigh Structural Steel Co., Allentown, Pa.; through H. Y. Smith Construction Co.

350 tons, Illinois highway bridges, Alexander and Bureau counties, to Midland Structural Steel Co., Cicero, Ill.

340 tons, state bridge, Belvidere, Allegheny county, New York, to Lackawanna Steel Construction Corp., Buffalo; through Wheeler Engineering Co. Inc.

200 tons, state highway bridge RC-NRH-3421, Leroy-Pavilion, Genesee county, New York, to Lackawanna Steel Construction Corp., Buffalo; William J. Gallagher, Medina, N. Y., general contractor.

170 tons, tunnel roof for Pennsylvania railroad, Baltimore, to American Bridge Co., Pittsburgh; through Arundel Corp., Baltimore.

160 tons, state bridge, Malone-Fort Covington, Franklin county, New York, to Fort Pitt Bridge Works Co., Pittsburgh; through Lord, Humphrey & Co.

150 tons, school unit, William Memorial institute, New London, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.; through Topper & Griggs.

Shape Awards Compared

	Tons
Week ended Aug. 26	5,082
Week ended Aug. 19	9,296
Week ended Aug. 12	7,668
This week in 1932	16,453
Weekly average, 1932	14,285
Weekly average, 1933	14,401
Weekly average, July	15,809
Total to date, 1932	544,223
Total to date, 1933	504,037

155 tons, bureau of roads bridge, Marion county, Oregon, to unnamed interests.

150 tons, state bridge, Harper county, Oklahoma, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

135 tons, state bridge, Franklin county, New York, to Fort Pitt Bridge Works, Pittsburgh.

130 tons, bridge, Pennsylvania railroad, Spring Brook, N. Y., to American Bridge Co., Pittsburgh.

125 tons, state bridge, Lamont, Grant county Oklahoma to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa; Roberts & Fisher, Norman, Okla., general contractors.

100 tons, postoffice, North Hollywood, Calif., to McClintic-Marshall Corp., Los Angeles.

Contracts Pending

2000 tons, buildings, Rockland State hospital, Orangeburg, N. Y.; bids Sept. 6.

1800 tons, Little Bay bridge, Dover-Newington, N. H.; Lackawanna Steel Construction Corp., Buffalo, low.

1600 tons, rebuilding Fifth regiment armory, Baltimore; bids Aug. 29 to Brig. Gen. Milton A. Reckford, military department, Maryland.

1500 tons lookout towers, various locations, United States department of agriculture, Washington.

1500 tons, community apartment, Philadelphia for which government financial aid has been made available; Alfred Kastner and Oscar Stonerov, Philadelphia, architects; specifications to be issued later.

1400 tons, state bridges, six counties, West Virginia; bids Aug. 30.

1100 tons, additional for building, American Museum of Natural History, New York.

1000 tons, two bascule bridges, Sloop Channel and Long Creek, Belmont State Park, Jones Beach Parkway, Long Island, N. Y.; Frederick Snare Corp., New York, general contractor.

932 tons, bridge, Missouri river, Roosevelt and Richland counties, Montana; bids Aug. 23.

735 tons, ward for General hospital, San Francisco; bids postponed from Aug. 16 to Nov. 15.

650 tons, addition to state hospital, Mt. Morris, N. Y., Weinstein Co., Brooklyn N. Y., low.

475 tons, bridge, Michigan.

450 tons, Flambeau bridge, Park Falls, Wis.; bids soon.

400 tons, Cook county nurses' home, Chicago.

350 tons, Santa Fe railroad subway, Ashland avenue, Chicago.

297 tons, bridge, route No. 6, section I-E over New Jersey & New York railroad, Hasbrouck Heights, N. J.; bids Sept. 11.

285 tons, piling, lower approach Harvey Lock, Harvey, La.; bids Sept. 7, United States engineer, New Orleans. Works also takes 58 tons of reinforcing bars.

260 tons, state bridges, Texas; bids in Aug. 28.

250 tons, bridge, Independence, Wis.; bids soon.

250 tons, plant for Heidelberg Brewing Co., Covington, Ky.

250 tons, school No. 37, Buffalo; bids about Oct. 1.

180 tons, brewery for Valley Mead Brewing Co., Meadville, Pa.

148 tons, state bridge, St. Charles parish, Louisiana; bids Sept. 19.

Concrete Bars

Market Featured with Award of 3560 Tons for Milwaukee Sanitation Project—Tonnage for the Week Shows Improvement —Price Advance Expected

REINFORCING BAR PRICES, PAGE 53

Chicago—Reinforcing bar orders show little change in number or volume. Prospective work on which bids have yet to be asked will take large but unstated tonnages, including Illinois highway construction and Mississippi river improvements. Wisconsin has placed 700 tons for road work. Other awards include 250 tons for a Milwaukee grain elevator and 100 tons for a Ft. Wayne, Ind., brewery.

For a Milwaukee sewage disposal plant 3560 tons of concrete bars have been awarded.

Pittsburgh—Orders for new billet steel bars for reinforcing purposes are small. Although the market was tested recently at 1.75c for cut lengths, recent orders have been hardly large enough to bring out much competitive bidding. It is as yet undecided whether a price of 1.75c or 1.85c will be filed under the steel code as the cut length price on bars to distributors.

Cleveland—Demand for concrete reinforcing steel is restricted to small lots, with the price of new billet steel in mill lengths holding at 1.65c, base, Cleveland, and 1.60c, Pittsburgh. A government loan now is being sought for the Cleveland incinerator for which 250 tons of bars are required. Bids were opened by the state at Columbus Aug. 25 on various road projects taking 145 tons of mesh and 114 tons of bars.

Boston—Reinforcing concrete bar demand is largely for small lots. Bridges and prospective highway construction are expected to stimulate buying later. Rail steel bars also are sluggish and rerolling mills in New England are operating at a low rate.

New York—Increasing volume of highway mesh is reaching steel mills, mainly in the Pittsburgh district, for New York state roads. More than 3000 tons is required in contracts now out. Billet and rail steel reinforcing bars are sluggish, although small-lot volume holds fairly well.

Philadelphia—The outlook in reinforcing bar demand is better. Bids have just been opened on 100 tons for a plant addition for the Ehret Magnesia Mfg. Co., Port Kennedy, Pa., and bids will be opened Aug. 29 on 200 tons for a plant building for the James Lee's Sons' Co., Bridgeport, Pa. In addition a substantial tonnage is expected to result from a new program of road work in New Jersey.

Contracts Placed

3560 tons, Milwaukee sewage disposal plant, divided between Concrete Steel Co., Chicago, and Truscon Steel Co., Youngstown, O.

700 tons, Wisconsin road work 200 tons to Concrete Engineering Co., remainder to Concrete Steel Co., Kalman Steel Co. and unstated interest.

375 tons, mesh, Sunrise highway extension, Suffolk county, New York, to American Steel & Wire Co., New through Good Roads Engineering & Construction Co.

325 tons, mesh, Ocean parkway and Captree Island causeway, Suffolk county, New York, to American Steel & Wire Co., New York; through Andrew Weston Co. Inc.

300 tons, mesh, highway SAA, Saratoga-Glen Falls, New York to Kalman Steel Corp.; through S. A. Scullen Inc.

312 tons, passenger station and terminal facilities, Southern Pacific railroad, Houston, Tex., to Concrete Engineering Co., Houston; Nathan Wohlfield, Dallas, general contractor.

260 tons, specification A-3269-A, bureau of reclamation, Denver, for Boulder dam. Allocated as follows: To Pacific Coast Steel Corp., Los Angeles, 130 tons; to Colorado Fuel & Iron Co., Denver, 130 tons.

250 tons, mesh, highway, Skaneateles-Lafayette, Onondago county, New York, to American Steel & Wire Co., New York; through Syracuse Paving & Construction Co.

250 tons, grain elevator, Milwaukee, for Kurth Malt Co. to Calumet Steel Co., Chicago.

190 tons, plant for Continental Can Co., San Jose, Calif., to Soule Steel Co., San Francisco.

176 tons, 4-story warehouse Niagara Frontier Food Terminal, Buffalo, to unstated fabricator; J. W. Cowper Inc., Buffalo, general contractor.

102 tons, state bridge, Harper county, Oklahoma, to Sherman Machine & Iron Works, Oklahoma City, Okla.

100 tons, building, Berghoff Brewing Co., Ft. Wayne, Ind., to Calumet Steel Co., Chicago.

100 tons, building, Pevely Dairy Co., St. Louis, 80 tons bars to Missouri Rolling Mill; 20 tons structurals and ornamental iron to Kaysing Iron Works; C. H. Schroeder Building & Construction Co., St. Louis, general contractor.

100 tons, highway No. 4, Childress county, Texas, divided between Carter-Waters Co., Oklahoma City, Okla., and Truscon Steel Co., Youngstown, O.; through Aroole Construction Co., Waco, Texas.

Concrete Awards Compared

	Tons
Week ended Aug. 26	**6,500**
Week ended Aug. 19	**3,708**
Week ended Aug. 12	**390**
This week, 1932	**2,713**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,336**
Weekly average, July	**5,282**
Total to date, 1932	**143,610**
Total to date, 1933	**116,869**

Contracts Pending

2800 tons, road and bridge work, St. Charles, Rapides and Orleans parishes, Louisiana; bids to state highway commission, Aug. 29, Sept. 5 and Sept. 29.

1550 tons, bars and mesh, state highways and bridges, Texas; bids in Aug. 28.

875 tons, storm drains for Los Angeles; bids soon.

625 tons, Eaton Wash dam, Los Angeles; bids rejected.

450 tons, addition, marine hospital Buffalo; bids of Aug. 24 returned unopened. Also bids received same date on postoffice, Malone, N. Y., and postoffice, Greensburg, Pa., Aug. 22.

400 tons, nine Washington state highway jobs; bids opened at Olympia, Aug. 29.

324 tons, tunnel work for San Gabriel dam No. 1, Los Angeles; bids Sept. 5.

200 tons, plant building James Lee's Sons' Co., Bridgeport, Pa., general contractors' bids Aug. 29.

200 tons, ward for General Hospital, San Francisco; bids postponed from Aug. 16 to Nov. 15.

130 tons, two bascule bridges, Jones Beach Parkway, Long Island, N. Y.; Frederick Snare Corp., New York, general contractor.

128 tons, bridge, route No. 6, section I-E over New Jersey & New York railroad, Hasbrouck Heights, N. J.; bids Sept. 11.

100 tons, plant addition, Ehret Magnesia Mfg. Co., Port Kennedy, Pa., bids opened.

100 tons, additions to Washington state hospitals at Sedro Woolley and Medical Lake; bids in.

Refuses To Lower Taxes

Lackawanna, N. Y., city officials have rejected a plea of the Bethlehem Steel Corp. for a reduction in the assessment on the company's plant. The valuation for taxes recently was increased by $13,000,000. The matter now goes to the courts for final disposal.

Reopens Mills at Amherst

Canadian Car & Foundry Co. has reopened two rolling mills at Amherst, N. S., for ten weeks, giving employment to 150 men.

Pipe

Heavy Tonnage in View for 800-Mile Oil Line—Cleveland Work Held Up Pending Action on Loan

PIPE PRICES, PAGE 53

Chicago — Cast pipe business remains slow. Inquiries are appearing mainly from small municipalities, larger centers doing little buying. Additional steel pipe line projects are taking form. A group of independent oil companies are understood to be planning construction of an 800-mile line from the mid-continent field to Chicago where a refinery would be built. Steel requirements for the entire project would be between 75,000 and 100,000 tons. Plans still are in the formative stage.

Birmingham, Ala.—Pipe awards are expected to warrant increased production shortly. Hundreds of projects are reported where federal financing is awaited.

Pittsburgh—Buying of some grades of tubular goods is expected to pick up in September. Discounts continue on pipe as of the July 1 card, and no early change is forecast. A resumption of buying by jobbers to fill out sizes, and an improvement in general demand for pipe is anticipated for the early fall. Pipe mill operations here are slowing, since several mill stock orders have been completed.

Cleveland—Pending this city's application for an R.F.C. loan, 18,000 tons of cast pipe for watermains are held up. Successful bidders for general contracts have not yet received their contracts. The project, however, will proceed, regardless of whether a loan is obtained. Similar projects in other Ohio cities are awaiting action on federal loans. The market for pipe is quiet.

Boston—Cast pipe demand is light with little business pending. Boston has placed a small tonnage of iron culvert pipe, 8000 feet of 8-inch. Merchant pipe is also moving slowly.

New York—Miscellaneous requirements for highway construction and other state work furnishes the bulk of inquiry for cast iron pipe. Buying is light, generally in small lots. Bids have in some instances shaded listed prices. With building construction here still quiet, the movement of commercial pipe remains slow. Most jobbers are well stocked, their supplies being estimated as sufficient for about two months under normal conditions.

Cast Pipe Placed

1112 tons, 24 and 30-inch class B and C, Denny Way improvement, Seattle, to United States Pipe & Foundry Co., Burlington, N. J.

400 tons, 6 to 10-inch class 200, Fresno, Calif., to Pacific States Cast Iron Pipe Co., Provo, Utah.

333 tons, 6 to 16-inch class 150, Signal Hill, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

118 tons, 12-inch and under, state hospital, Wassaic, N. Y., to Donaldson Iron Works.

100 tons, 6 to 12-inch class 150, fair grounds for Los Angeles county, Pomona, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6, 8 and 12-inch class 150, for Sumner, Wash., to Pacific Water Works Supply Co., Seattle; French materials.

100 tons, 8 and 10-inch class B, for Buckley, Wash., to Pacific Water Works Supply Co., Seattle; French materials.

Steel Pipe Placed

Unstated tonnage, 7600 feet, small sizes, welded steel pipe, navy, Mare Island, Calif., to Republic Steel Corp., Youngstown, O.; bids Aug. 1.

Cast Pipe Pending

1850 tons, Oakland, Calif; United States Pipe & Foundry Co., Burlington, N. J., low.

250 tons, 18 and 20-inch, sewers, Westchester county, New York; readvertised bids in.

198 tons, 10 and 16-inch class 150, Ventura, Calif.; bids rejected and city will purchase steel pipe in open market.

125 tons, 24-inch and under, state hospital, Willard, N. Y.

Steel Pipe Pending

800 miles 8 to 12-inch oil line pipe; line proposed by group of independent companies to be laid from mid-continent field to Chicago.

120 tons, galvanized and black extra strong, mostly former, 4-inch and under, except 1800 feet, 12-inch, Panama schedule 2895; bids Sept. 1. Largest item calls for 24,000 feet, 1-inch galvanized.

Unstated tonnage, 2,700,000 feet 1-inch tubing and 500,000 feet, same, reclamation service, Denver; Laclede Tube Co., St. Louis low, $61,050 and $11,100, f.o.b. Alton, Ill.

Palmer Radiator & Body Works, 580 South Boyle avenue, Los Angeles, manufacturer of a cooling system with copper radiators, has increased its payroll to 22 men and its consumption of copper to 40,000 pounds per month.

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Equipment

Report New Strip Mill in Pittsburgh District

Pittsburgh—Steel mill equipment builders in this district remain busy on orders booked through late last spring and early summer, when several plant rehabilitation programs got under way. New business, however, is lacking. A report is heard concerning an inquiry for a 72-inch continuous strip mill for a steel producer west of here, in addition to new blast furnace and open-hearth capacity likewise planned. Repairs are being made to the Steubenville, O., blast furnace of Wheeling Steel Corp., which gave recent trouble when it was planned to be blown in.

Chicago — While machinery and equipment sales have moderated the past few weeks occasional orders are appearing and business still compares favorably with early-year activity. Users of small tools and miscellaneous supplies appear to have filled the increased requirements which developed rapidly a few months ago and sales of such materials are slower this month. Heavy equipment buyers frequently inquire for used machines rather than new tools in the interest of economy. Little demand is appearing from schools and prospects of the early purchase of a large list of metalworking tools for a technical training school here now are less favorable.

New York—Sales in the aggregate are holding up well. Several dealers, first noting a mild upturn early in the summer, continue to add gradually to volume with the result August with these sellers is ahead of last month. The more optimistic look for an encouraging increase this fall. Manufacturing changes and adjustments, the result of operation of new codes in some industries and departments, are expected to result in tool buying.

Boston — Machine builders are booking little new business, although there are a few exceptions. Shops producing textile mill equipment continue active. Some grinding machinery sellers note a continued fair demand for export, but some slump in domestic inquiry. With the acceptance of codes by more industries and a consequent revision of production schedules, some machine tool business is expected to develop. Ball bearing plants continue active, automotive demand holding unusually well while some plants have benefited from an improved industrial demand for bearings. Several New England machine builders have raised quotations on standard tools.

Ferroalloys Reflect Slowing in Steelworks

Ferroalloy Prices, Page 54

Ferromanganese specifications are slower, in line with the reduction in steelmaking operations. Domestic spiegeleisen, 19 to 21 per cent, is moving steadily, however; it is estimated that shipments so far this month are equal to those in the corresponding period in July.

Dominion Steel & Coal Co. Ltd., Sydney, N. S., has started operation of its nail and wire mill to build up stocks at Montreal, Que., and other centers. Several months' activity is planned. Additional workers needed for this mill bring the payroll to 1700 men, the largest in two years.

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Prices Advance $1 in Eastern Markets—Inquire for 10,000 Tons of Basic Iron

PIG IRON PRICES, PAGE 54

Philadelphia—Eastern pig iron producers have advanced all grades of foundry, basic, malleable and bessemer pig iron $1 a ton for shipment to Oct. 1. Southern producers are reliably reported contemplating a similar advance for northern shipment. The advance became effective Aug. 25, and the new prices are expected to be filed under the iron and steel code this week. It is believed the fourth quarter pig iron prices, when filed in September, will show no further change. Buffalo prices have been advanced 50 cents at the furnace, but Buffalo producers will bring their prices in eastern territory up to the new levels.

An inquiry for 10,000 tons of basic for an eastern Pennsylvania consumer for fourth quarter features the market.

Pittsburgh—The inquiry for basic iron of one large nonintegrated steel mill here appears unlikely to develop and leaves the market devoid of both orders and inquiries of any consequence. On the small infrequent less-carload buying of iron, the present schedule is holding, on the Neville Island base of $17 on foundry grades, $17.50 on bessemer, and an untested $16.50 market on basic. Although the Struthers, O., merchant stack has been in the process of being repaired for the past several weeks, an early blowing in is not indicated.

Cleveland—Interlake Iron Corp. relighted the second of its two blast furnaces at Toledo, O., last week, the first having resumed a month ago. This is a reflection of increasing pig iron shipments. New sales, however, continue to diminish, not much more than 1000 tons having been booked by Cleveland interests during the week. Makers are preparing to file prices to apply under the NRA program; and in the meantime $16.50, base, Cleveland, for local and outside shipment, is firm.

Chicago—While shipments are setting a new high monthly mark for the year to date, new business is light. Occasional small orders are being received but, with consumers generally well covered for the balance of the quarter, opening of fourth quarter books is awaited for the making of additional purchases. Foundry operations are well maintained, and iron stocks are being increased moderately by current shipments.

Boston—New sales are light, largely small lots. Increase in foundry melt, based on the latest report from the Worcester, Mass., district, was more than 300,000 pounds during the month covered. New business is being done on a basis of $18, minimum, Everett, with other sellers in line, possibly excepting some imported brands. More low phosphorus iron has been arriving in this district against old contracts.

New York—Pending the filing of prices under the steel code, buying has been light. However, an increasing number of inquiries appears for fourth quarter. Under the revised code basing points have been established for low phosphorus pig iron, three in the East—Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.; and one in the South—Johnson City, Tenn. To the list of basing points on other grades, Jackson, O., has been added.

Buffalo—Belief is held that fourth quarter books of local producers will be opened this week. Buyers are keenly interested in the new price and apparently reconciled to an advance. Several inquiries are out for 100 to 200 tons for September shipment but the absence of prices prevents large tonnage deals. Shipments indicate a slight improvement in the foundry melt.

Cincinnati—Movement of iron this month has increased an estimated 25 per cent over July. Consumers with contracts, even beyond Oct. 1 and signed before code agitation, are heeding advice to specify the tonnage lest contracts be annulled. New buying during the past week was confined to spot shipments of light tonnage.

Birmingham, Ala.—Melters continue to specify only for immediate needs. Six stacks continue on foundry iron and the two larger furnaces of Tennessee Coal, Iron & Railroad Co. are active on basic grades. Republic Steel Corp. is operating its Spaulding ore mines again after an idleness of seven years and will produce 1000 tons of ore daily there.

St. Louis—New purchasing continues light but shipments are holding at the high levels of recent weeks. Melt is increasing moderately, foundry grades making a relatively much more favorable showing than basic iron. The main reason for this is that mills in the district are using unusually large tonnages of scrap in their mixtures. Sales are at the full current quotation, with silicon differentials strictly observed.

Toronto, Ont.—Merchant sales showed some improvement during the week. No advance buying has been reported, but melters are entering the market more frequently for spot shipments. Production for July nearly equaled the entire output for the first six months of the year, and it is estimated that August production will approximate 40,000 tons. Prices are firm and unchanged.

Coke

Coke in Good Demand; Prices Are Advancing

Coke Prices, Page 54

Specifications for beehive coke dwindled last week, although prices remain strong. Furnace coke ranges between $2.50 and $2.75, Connellsville ovens. On foundry coke, a higher market is in evidence, up to $3.25, Connellsville ovens, being done recently.

Foundry coke shipments to date this month at Chicago are heavier than in July and August is expected to be the most active month so far this year. Prospects of higher prices have helped to stimulate demand, though consumption holds previous gains and some users are operating on small stocks. September prices have been announced 50 cents per ton on foundry coke, to $8.00, ovens, for outside delivery and $8.25, delivered Chicago. At Cincinnati by-product foundry coke has been advanced 50 cents to $9.09, delivered, and domestic 25 cents to $5.31, wholesale, delivered, effective Sept. 1.

Finish Ural Machine Works

USSR chamber of commerce, Moscow, announces that the Ural Machine Building Works, primarily to supply equipment for the Ural and Siberian foundries, was officially opened July 15. The steel foundry includes three tilting Martin furnaces of the Wellman type with an annual capacity of 50,000 tons. The gray

iron foundry has six cupolas and a high frequency electric furnace, the annual capacity being 25,000 tons and the limit on individual castings 80 tons.

Men of Industry

(*Concluded from Page 27*)

Steel Co. he has continued with the company in a sales capacity ever since.

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F. M. Lee, branch manager of the Western Machinery Co., Salt Lake City, Utah, has been transferred to its Sacramento, Calif., branch, in charge of rebuilding machinery.

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Robert E. Sherlock, formerly metallurgist with the Republic Steel Corp. at the Donner Steel Co. plant, Buffalo, has accepted a position in the alloy steel division of the Youngstown Sheet & Tube Co., at Indiana Harbor, Ind.

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John E. Minty has been appointed general manager, Shaw-Box Crane & Hoist Co., Muskegon, Mich. He formerly was works manager, and has been associated with the company 12 years since his graduation from Cornell university.

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Frank L. Estep, vice president, Perin Engineering Co. Inc., New York, returned Aug. 17 from a visit to India in connection with a sheet mill extension at the plant of the Tata Iron & Steel Co. This improvement was described in a recent issue of STEEL. On his return trip Mr. Estep visited China and Japan.

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George Boole, vice president, A. M. Castle & Co., Chicago, and resident manager of the company's Seattle warehouse, has been elected senior vice president and resident manager at San Francisco, succeeding the late Roy L. Sanford. Erskine Campbell, vice president at Seattle, has been appointed resident manager for the company in Seattle.

□ □ □

H. E. Ewart, formerly assistant chief engineer, United Engineering & Foundry Co., Pittsburgh, since Aug. 1 has been representing the Bantam Ball Bearing Co. in the Pittsburgh district. Mr. Ewart, whose experience in the steel mill and industrial field dates back to 1909, was with the Tennessee Coal, Iron & Railroad Co. prior to going with the United company.

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William T. Conlon has been appointed manager of the industrial department, the Superheater Co., New York. He will have charge of design, manufacture and sale of superheaters for all types and makes of boilers for public utility and industrial power plants. Since November, 1929, Mr. Conlon has been serving in an executive sales capacity. Prior to joining the company he was associated with Utica Gas & Electric Co. He graduated from Purdue university in 1920.

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Clyde P. Craine, president, Craine-Schrage Steel Co., has been elected president of the Detroit chapter of the American Steel Warehouse association. Other officers are: Secretary-treasurer, L. S. Roehm, assistant manager, Jones & Laughlin Steel Corp.; vice president and chairman of the hot rolled committee, E. M. Vehmeyer, manager Detroit plant, Joseph T. Ryerson & Son Inc.; vice president and chairman of the cold finished committee, W. J. Clucas, manager Detroit plant, Edgar T. Ward's Sons Co.; vice president and chairman of the bolt and nut committee, F. Wittman, manager of Jones & Laughlin Steel Corp.; vice president and chairman of the sheet division, A. C. Barrickman, manager, Wheeling Corrugating Co.; and vice president and chairman of the tubular committee, D. C. VanPelt, manager Steel Service Co.

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Philip M. Morgan, Morgan Construction Co., Worcester, Mass., has been elected president of the newly-organized Wire Machinery Builders' association, which will be affiliated with the Machinery and Allied Products institute. Organizers of the association, meeting at New York, considered the details of a tentative code which will be filed through the institute. Other officers of the association are: L. A. Vaughn, Vaughn Machinery Co., and Josiah Judd, Thomson-Judd Wire Machinery Co.; vice presidents; George D. Hartley, Sleeper & Hartley Inc., secretary and treasurer; W. D. Pierson, Waterbury Farrel Foundry & Machine Co.; E. F. Shuster, F. B. Shuster Co.; L. A. Vaughn and E. J. Scudder, E. J. Scudder Foundry & Machine Co., executive committee; A. R. Petterson, Thomson-Judd Wire Machinery Co.; W. D. Pierson and J. R. Dorer, code committee.

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Scrap

Buying and Shipments Decline —Prices Hold Strength—Better Movement Forecast

Pittsburgh—An easier trend in steel and iron scrap became more pronounced last week with suspension of shipments on orders at many consuming plants and marked reluctance of these buyers to show interest in forward requirements. Although the No. 1 steel market remains at $13.50 to $14, another quiet week like the last undoubtedly will bring distress selling and a weaker price. Rejections of No. 2 steel were a recent feature and over 40 cars of scrap were turned back to brokers last week. An adjustment has been made on bundles, bringing that range to $13.25 to $13.75. Blast furnace scrap here was sold last week at $9.75 putting the market down 25 cents. Monthly railroad lists are expected from Pennsylvania and Baltimore & Ohio railroads. Heavy break-

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.50 to 10.50
Boston, dealers	7.25 to 7.50
Buffalo, No. 1	11.00 to 11.50
Buffalo, No. 2	10.00 to 10.50
Chicago	10.00 to 10.50
Cleve., No. 1	10.50 to 11.00
Cleve., No. 2	10.00 to 10.50
Det., No. 1	9.50 to 10.00
Det., No. 2	8.50 to 9.00
E. Pa.	12.00
E. Pa., No. 2	10.50
Federal, Ill.	8.75 to 9.25
Granite City, Ill.	8.25 to 8.75
N. Y., deal. lt. R.	8.00 to 8.50
N. Y., deal. No. 2	7.00 to 7.50
N. Y. deal. yd.	6.50 to 6.00
Pitts., No. 1	13.50 to 14.00
St. L. No. 1 del.	9.75 to 10.25
Valleys, No. 1	13.00 to 13.50

COMPRESSED SHEETS

Buffalo, dealers	9.50 to 10.50
Chi. (Factory)	8.50 to 9.00
Cleveland	10.00 to 10.50
Detroit	9.50 to 10.00
E. Pa. new mat.	11.00 to 11.50
Pittsburgh	13.25 to 13.75
Valleys	12.50 to 13.00

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cincinnati, del.	6.00 to 6.50
Cleveland	8.00 to 8.50
Eastern Pa.	9.00 to 10.00
Pittsburgh	12.25 to 12.75
St. Louis	6.00 to 6.50

SHEET CLIPPINGS LOOSE

Chicago	5.00 to 5.50
Cincinnati	5.00 to 5.50
Detroit	6.50 to 7.00
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	11.50 to 12.00
Boston, dealers	7.00 to 7.25
Buffalo	12.00 to 12.50
Chicago (3 ft.)	11.50 to 12.00
Chicago (2 ft.)	12.50 to 13.00
Cincinnati, del.	12.00 to 12.50
Detroit	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	15.75 to 16.25
St. Louis	11.50 to 12.00

STOVE PLATE

Birmingham	7.00 to 8.00
Boston, dealers	4.50 to 4.75
Buffalo	9.00 to 9.50
Chicago, net	7.50 to 8.00
Cinci., deal.	7.00 to 7.50
Detroit, net	4.50 to 5.00
Eastern Pa.	9.50
N. Y. deal. Fdry.	6.00 to 6.50
St. Louis	7.00 to 7.50

COUPLERS, SPRINGS

Buffalo	11.50 to 12.00
Chicago	11.00 to 11.50
Eastern Pa.	14.00 to 15.00
Pittsburgh	15.25 to 15.75
St. Louis	10.00 to 10.50

ANGLE BARS—STEEL

Chicago	11.00 to 11.50
St. Louis	10.00 to 10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50 to 12.50
Cleveland bil. and bloom crops	12.50 to 13.50
Eastern Pa.	14.00 to 15.00
Pittsburgh billet bloom crops	16.50 to 17.00
Pitts., sheet bar crops	16.00 to 16.50

FROGS, SWITCHES

Chicago	10.00 to 10.50
St. Louis	10.00 to 10.50

SHOVELING STEEL

Chicago	10.00 to 10.50
Cleveland	6.75 to 7.00
St. Louis	9.00 to 9.50

RAILROAD WROUGHT

Birmingham	8.00 to 8.25
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	7.00 to 8.00
Buffalo, No. 2	11.00 to 11.50
Chi., No. 1, net	8.00 to 8.50
Chi., No. 2	10.25 to 10.75
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	13.00
N. Y., No. 1 deal.	8.00 to 8.50
Pitts., No. 1	13.50 to 14.00
St. Louis, No. 1	7.00 to 7.50
St. Louis, No. 2	8.75 to 9.25

SPECIFICATION PIPE

Boston	4.00 to 4.50
Eastern Pa.	9.50 to 10.00
N. Y., deal.	5.50 to 6.00

BUSHELING

Buffalo, No. 1	9.50 to 10.50
Chicago, No. 1	8.50 to 9.00
Cinci., No. 1 deal.	7.00 to 7.50
Cinci., No. 2	3.50 to 4.00
Cleve., No. 2	8.00 to 8.25
Det., No. 1 new	8.25 to 8.75
St. Louis, No. 1	6.50 to 7.00
Val. new No. 1	12.50 to 13.00

MACHINE TURNINGS

Birmingham	3.50 to 4.50
Boston, dealers	4.25 to 4.50
Buffalo	6.75 to 7.25
Chicago	5.50 to 6.00
Cinci., deal.	5.50 to 6.00
Cleveland	8.00 to 8.25
Detroit	6.50 to 7.00
Eastern Pa.	8.00 to 8.50
N. Y., deal.	4.50 to 5.00
Pittsburgh	10.50 to 11.00
St. Louis	4.50 to 5.00
Valleys	10.75 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	3.25 to 3.50
Buffalo	6.75 to 7.25
Cinci., deal.	5.50 to 6.00
Cleveland	8.25 to 8.50
Detroit	7.00 to 7.50
Eastern Pa.	7.00 to 7.50
N. Y., deal.	4.50 to 5.00
Pittsburgh	9.50 to 10.00

CAST IRON BORINGS

Birming., plain	3.50 to 4.50
Boston, chem.	10.00 to 11.00
Boston, dealers	3.25 to 3.50
Buffalo	6.75 to 7.25
Chicago	6.00 to 6.50
Cinci., deal.	5.50 to 6.00
Cleveland	8.25 to 8.50
Detroit	7.00 to 7.50
E. Pa., chem.	12.00 to 15.00
N. Y., deal.	4.50 to 5.00
Pittsburgh	9.50 to 10.00
St. Louis	4.75 to 5.25

PIPE AND FLUES

Cinci., deal.	4.50 to 5.00

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	7.00 to 7.50
Cincinnati	5.00 to 5.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	5.25 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, dealers	5.00 to 5.50
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	9.00 to 9.50
Detroit	8.00 to 8.50

FORGE SCRAP

Boston, dealers	4.00 to 4.50
Chicago (heavy)	11.50 to 12.00
Eastern Pa.	10.50

ARCH BARS, TRANSOMS

Chicago, net	8.00 to 8.50
St. Louis	9.50 to 10.00

AXLE TURNINGS

Boston, dealers	4.50 to 4.75
Buffalo	7.50 to 8.00
Chi., elec. fce.	8.00 to 8.50
Cleveland	9.50 to 10.00
Eastern Pa.	10.00 to 10.50
St. Louis	5.50 to 6.00

STEEL CAR AXLES

Birmingham	9.50 to 10.50
Boston, ship. pt.	8.00 to 8.50
Buffalo	10.00 to 11.00
Chicago, net	11.50 to 12.00
Eastern Pa.	15.50
St. Louis	11.50 to 12.00

SHAFTING

Boston, ship. pt.	10.00 to 10.25
Eastern Pa.	15.00 to 15.50
N. Y., deal.	10.00 to 10.25
St. Louis	8.00 to 8.50

CAR WHEELS

Birming., iron	8.50 to 9.50
Boston, iron deal.	6.75 to 7.25
Buffalo, iron	8.00 to 9.00
Buffalo, steel	11.00 to 11.50
Chicago, iron	9.50 to 10.00
Chi., rolled steel	11.50 to 12.00
Cincinnati, iron	9.00 to 9.50
E. Pa., iron	12.00 to 13.00
E. Pa., steel	14.00 to 15.00
Pitts., iron	12.75 to 13.25
Pitts., steel	15.25 to 15.75
St. Louis, iron	8.50 to 9.00
St. Louis, steel	10.00 to 10.50

NO. 1 CAST SCRAP

Birmingham	9.50 to 10.00
Boston, No. 2	5.00 to 5.50
Boston, Tex. con.	10.75 to 11.00
Buffalo, cupola	10.00 to 10.50
Buffalo (mach.)	11.00 to 11.50
Cleve. cupola	10.50 to 11.00
Chi., mach. net	10.00 to 10.50
Chi., railroad net	9.50 to 10.00
Cinci., mach. cup.	9.00 to 9.50
Cleve. cupola	10.00 to 10.50
Detroit, net	8.50 to 9.00
E. Pa., cupola	12.00 to 13.00
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	10.50 to 11.00
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. Louis, No. 1	9.00 to 9.50
St. L. No. 1 mach.	9.00 to 9.50

HEAVY CAST

Boston, del.	5.50 to 5.75
Buffalo, break	7.00 to 8.00
Cleve., break	7.50 to 8.00
Detroit, auto net	9.50 to 10.00
Detroit, break.	6.50 to 7.00
Eastern Pa.	11.00 to 11.25
N. Y., No. 1, deal.	7.00 to 7.50
N. Y., break. deal.	6.75 to 7.00
Pittsburgh	10.50 to 11.00

MALLEABLE

Boston, consum.	12.50 to 13.00
Buffalo	11.50 to 12.00
Chicago, R. R.	10.50 to 11.00
Cinci., agri. del.	8.75 to 9.25
Cinci., R. R. del.	9.25 to 9.75
Cleveland, rail	11.50 to 12.00
Detroit, auto	8.50 to 9.00
St. Louis, R. R.	9.50 to 10.00
Eastern Pa., R. R.	13.00 to 14.00

RAILS FOR ROLLING
5 feet and over

Birmingham	10.00 to 11.00
Boston, dealers	6.75 to 7.25
Buffalo	9.00 to 9.50
Chicago	11.00 to 11.50
Eastern Pa.	13.00
New York, dealer	8.00 to 8.25
St. Louis	10.50 to 11.00

LOCOMOTIVE TIRES

Chicago, cut	11.00 to 11.50
St. L., No. 1	8.50 to 9.00

LOW PHOS. PUNCHINGS

Buffalo	11.00 to 11.50
Chicago	11.50 to 12.00
Eastern Pa.	13.00 to 14.00
Pittsburgh	15.50 to 16.00

able cast for Brackenridge, Pa., appears higher on a small $11 order.

Cleveland—A lull in buying has developed and activity is confined to shipments on contracts, though melters are deferring shipments where possible. Further buying is expected early in September. A cargo of 3600 tons of heavy melting steel has arrived from Duluth for a steelworks here.

Chicago—Scrap is in poor demand from mills. While shipments against most previous orders have been completed little interest is shown in new purchases. This situation largely is a reflection of recent hesitation in steel demand and gives the market an easier tone. Some heavy melting steel previously was sold at $10.25 with one distress lot at $10 but in the absence of consumer bids the market recently has been nominal. Quotations on other grades generally are unchanged.

Boston — The upward trend in scrap prices has halted with slight recessions on a few grades, notably heavy melting steel for outside rail shipment and blast furnace borings and turnings. Delivered prices on steelmaking grades in New England are generally unchanged. Cast grades hold firm. Demand is less active.

New York—Steel and iron scrap is dull with an easy tendency in prices on some grades, notably No. 2 steel. The Buffalo district continues to take fair shipments of that grade by barge but shipments to some eastern mills are held up. Export inquiry is heavy but buyers have been unwilling to meet domestic prices. A slight reduction from present levels might bring buying.

Philadelphia—Scrap buying is featured by placing of 3000 tons of heavy breakable cast by an eastern Pennsylvania consumer at $11, delivered. Two other smaller sales of this material are also noted at $11 and $11.25, delivered. These transactions have boosted the market to $11 to $11.25. While the principal grades of heavy melting steel are nominally unchanged, prices are higher on knuckles and couplers, low phosphorus punchings, low phosphorus steel crops and rolled steel wheels. These changes are somewhat contrary to the general trend at the moment, for generally speaking demand is light.

Detroit—The market rules fairly steady at unchanged levels. While No. 1 steel continues between $9.50 and $10 evidence of a stronger trend is getting under way following the easier tendency of ten days ago. Loose sheet clippings continue between $6.50 and $7, while compressed sheets are carrying the same range as No. 1 steel.

Buffalo—Heavy receipts of scrap continue to reach this point from Duluth, Detroit, New York and other shipping centers. These arrivals apparently are ample for the needs of consumers as local purchases are being limited to small lots.

Cincinnati—Prices on iron and steel scrap have been softer during the past week, but there was no basis for lowering quotations. Mills continue to take shipments on contracts, but in some nearby territory, it was reported, temporary embargoes are in effect.

St. Louis—The market for iron and steel scrap continues strong, affected by a potential demand from mills and foundries, with scant offerings. A leading east side mill purchased 5000 tons of steel for delivery over the next 60 days. While prices were not divulged, it is understood the maximum figure of the recent upward movement was paid. Sales otherwise consisted mainly of small tonnages for prompt delivery.

Birmingham, Ala.—Much of the business now noted in iron and steel scrap is for spot delivery though there is still much due on contracts.

Toronto, Ont.—Trading in iron and steel scrap, while specialized, is gradually expanding. Demand for steel grades is mostly against export orders although dealers report occasional sales for domestic consumption. Dealers are out of the market and prices are unchanged.

Bolt, Nut Buying Slower; Price on Firm Basis

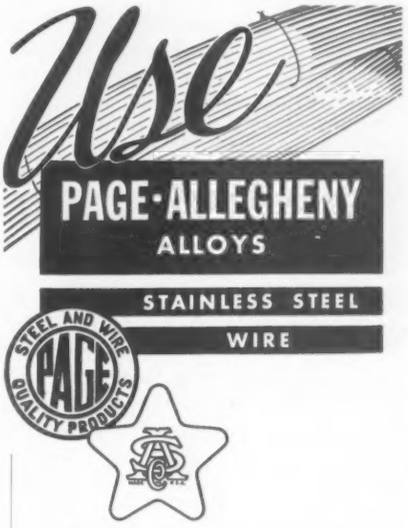
Bolt, Nut, Rivet Prices, Page 53

Bolt and nut buying is becoming less frequent. Prices are firm and probably will continue unchanged for this quarter at 73 off list for bolts and nuts, 2.50c, Pittsburgh, and 2.60c, Chicago, for large rivets. Small rivets are 70, 10 and 5 off. Railroads still are taking only moderate lots and farm implement manufacturers show little improvement in buying.

Semifinished Market Slower; Prices Steady

Semifinished Prices, Page 54

Tin plate producers still are taking the heaviest tonnage of sheet bars. Open market transactions for billets and slabs involve smaller tonnage. One mill in the Pittsburgh district has been rolling on several thousand tons of 1 per cent chrome billets, which have been specified by a Detroit buyer, to a narrow 47-52-point carbon range. The billets are in 2-inch sizes and quenched in oil, and are being specified to a 150,000-pound yield point. The market on carbon billets as well as on sheet bars and slabs is nominally holding at $26, Pittsburgh. Wire rods are in active demand and unchanged at $35. Forging billets are $31.



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Warehouse

Buying Only Slightly Less; Prices Are Being Adjusted

Pittsburgh—Sales by local warehouses are considerably less than in July, which was a high point for the year. Prices are fairly firm. Turned and ground shafting remains unchanged out of warehouse, although an advance in the mill price was made recently.

Cleveland—Labor provisions of their general code having been approved, warehouses here now are working under the blue eagle. Business is slipping off slowly; not much in the number of orders, but mainly in volume. Prices are unchanged.

Chicago—Sales declined slightly the past week, principally because of lighter demand from country areas Orders from this district are holding well and business for the month is expected to compare favorably with July volume. Prices are unchanged.

Boston — Blue annealed sheets have been advanced $3 a ton following the increase on galvanized and black by jobbers three weeks ago. Volume is unchanged.

New York—A leading jobber seeking to stabilize prices of bolts, nuts and rivets has issued a revised price list. Prices of other products are steadier. Buying is about the same rate as in July.

Philadelphia — Warehouse prices are unchanged at the recently announced revisions, with trading slightly less since the first of the month.

Detroit—Warehouse interests look for improved business this fall when uncertainties created by codes in various industries have been quieted. Occasional small orders indicate increasing attention to new automobile models. Prices are unchanged.

Cincinnati—Tonnage moved from warehouse during the current month has been at the July average, chiefly for varied industrial requirements. Seasonal factors have had little influence in demand.

Baltimore—Several products have been advanced in the local warehouse market. Most were advanced $3 a ton. Blue annealed sheets have been increased $1, and black and galvanized are unchanged. A change in quantity differentials may be made in the near future. Trading is less active than a month ago.

St. Louis—Demand for iron and steel goods from store is making a surprisingly good showing for this season. Sales of the leading interests so far this month indicate a larger volume for the entire period than in July, also a notable gain over August, 1932.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore*	2.60c
Boston††	2.65c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	2.65c
New York‡ (d)	3.10c
Philadelphia*	2.60c
Pittsburgh	2.60c
Portland	3.15c
San Fran.	3.35c
Seattle	3.15c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore*	2.60c
Boston	3.25c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia*	2.60c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	2.75c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.00c-2.45c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	2.75c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.00c
San Fran. lcl	2.40c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia*	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.35c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼ in. and thicker	2.95c
Cleve., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia*	2.60c
Phila. floor	4.35c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.35c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.75c
Boston††	2.65c
Buffalo	3.10c
Chattanooga	3.44c
Chicago	2.85c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	2.90c
Houston	3.35c
Los Ang.	3.45c
New Orleans	3.25c
New York	3.00c
Portland	3.75c
Philadelphia*	2.75c
Pitts.**	2.75c
San Fran.	3.53c
Seattle	3.75c
St. Louis	3.10c-3.25c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.25c
Boston††	3.60c
Buffalo	3.25c
Chattanooga	3.50c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	4.05c
New York	3.65c
Philadelphia*†	3.30c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.15c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	3.75c
Buffalo	4.00c
Boston††	4.15c
Chattanooga	3.95c
Chicago	4.00c-4.10c
Cincinnati	4.15c
Cleveland	3.85c
Detroit	3.85c
Houston	3.57c
Los Ang.	4.65c
New Orleans	4.25c
New York	4.00c
Pitts.**	3.75c-4.00c
Portland	5.00c
San Fran.	4.75c
Seattle	5.00c
St. Louis	4.25c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	3.75c

†BANDS

Baltimore	2.90c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	3.00c
New York(d)	3.30c
Philadelphia	2.90c
Pittsburgh	2.95c
Portland	3.65c
San Fran.	3.15c
Seattle	3.65c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.20c

†HOOPS

Baltimore	2.80c
Boston	4.90c
Buffalo	3.55c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia	3.15c
Pittsburgh	3.60c
Seattle	5.15c
St. Paul	3.75c

COLD FIN. STEEL

Baltimore (c)	3.33c
Boston (g)	3.70-4.20c
Buffalo	3.00c
Chattanooga*	3.90c
Chicago	3.25c
Cincinnati	3.57c
Clevel'd, flats	3.40c
Do., rounds squares, hexagons	3.25c
Detroit	3.40c
Los Ang.	5.85c
New Orleans	4.25c
New York	3.79c
Philad. (c)	3.35c
Pittsburgh	3.20c
Portland (f)	4.50c
San Fran. (d)	5.85c
Seattle (f)	4.50c
St. Paul	3.20c
St. Louis	3.36c
Tulsa	4.65c

COLD ROLL. STRIP

Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex, only.
(b) Net base straightening, cutting boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras not included

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, New York, Chicago, Pittsburgh Cincinnati, Chattanooga and St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 3999 pounds, base; 4000 to 7999 pounds, 15 cents off; 8000 to 14,999 pounds, 30 cents off; 15,000 to 39,999 pounds, 50 cents off; 40,000 pounds and over, 60 cents off.

Pacific Coast

Awards Moderate but Pending Work Brings Much Tonnage—Boulder Dam Requirements Come Out Gradually—Cast Pipe Buying Is at Fair Rate—Most Stocks Are Low

San Francisco—(*By Air Mail*)—Although awards of steel products are not heavy a number of new projects have recently come up for figures. Warehouse prices in the San Francisco and Los Angeles districts have been advanced $4 to $10 a ton.

Concrete bar awards aggregated less than 600 tons. Soule Steel Co. secured 190 tons for a plant in San Jose, Calif., for the Continental Can Co. Colorado Fuel & Iron Co. and Pacific Coast Steel Corp. divided 260 tons for Boulder dam, Boulder City, Nev. Bids have been opened on 4000 tons for Boulder dam. Los Angeles will take bids shortly on 875 tons for storm drains and Sept. 5 will open bids on 324 tons for tunnel work for San Gabriel dam No. 1.

Southern Pipe Casting Co. booked 100 tons of plates for a pipe line for Los Angeles and unnamed interests took 100 tons for 13 tanks for the same city. Consolidated Steel Corp. was low bidder on 5200 tons for the Pine Canyon dam pipe line for Pasadena, Calif. Bids will be called for in October for several hundred tons for two destroyers to be built at the Mare Island navy yard. Prices are firm at 2.10c, c.i.f.

McClintic-Marshall Corp. took 100 tons of steel shapes for a postoffice at North Hollywood, Calif. Bids will be opened Aug. 23 for 932 tons for a bridge over the Missouri river in Montana. Bids were postponed from Aug. 14 to Nov. 15 for 735 tons for a ward for the General Hospital, San Francisco. Plain shapes hold at 2.10c, c.i.f., with wide flange material quoted at 2.20c.

Cast iron pipe awards totaled close to 1000 tons. Pacific States Cast Iron Pipe Co. booked 400 tons for Fresno, Calif. American Cast Iron Pipe Co. took 333 tons for Signal Hill, Calif. United States Pipe & Foundry Co. is low on 1850 tons for Oakland, Calif.

Crucible Steel Co. of America, New York, secured 300 tons of hollow drilled steel for delivery during 1933 to 1936 for the metropolitan water district, Los Angeles. Water

Code Delay Slows Buying

Seattle—The iron and steel industries of the Pacific Northwest are working under the handicap of delayed approval of codes. Wholesale jobbers are operating under their tentative code.

The week's largest award was placed with the United States Pipe & Foundry Co., Burlington, N. J., 1112 tons of 24 and 30-inch cast iron pipe for the Denny Way improvement, Seattle. From United States Steel Corp., Bethlehem Steel Co., Lukens Steel Co., and Worth Steel Co., Todd Dry Docks Inc., Seattle, has ordered 360 tons of plates to replenish yard stock. About 400 tons of concrete bars and 500 tons of shapes are involved in nine state jobs, bids Aug. 29.

Orgon has formally applied for $19,623,653 from the government for public works.

While the wholesale trade at the moment is less active, there has been a good movement of both mill and warehouse business during the last month.

Interest in the export scrap market is limited almost entirely to inquiry by Oriental buyers, who continue to seek obsolete vessel tonnage for breaking up.

Steel in Europe

Good Order Books in Britain; Export Demand Growing

London—(*By Cable*)—Business in steel and iron continues quiet but order books are fairly satisfactory and prospects for fall are hopeful. Works producing heavy steel are active. Overseas demand is expanding with good prospects for orders materializing. Denmark, Germany and Italy are buying pig iron. Continental competition in the export markets is keen. Galvanized sheet trade is improving.

The Continent reports export markets quiet. Berlin reports small tonnages booked for export to China and Japan.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Aug. 24

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
		£ s d		£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$13.31	2 18 6	$8.27	1 14 0
Basic bessemer	12.29	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	13.42	2 19 0	....	.....
SEMIFINISHED STEEL				
Billets	$22.75	5 0 0	$11.44	2 7 0
Wire rods, No. 5 gage	34.13	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$35.26	7 15 0	$26.77	5 10 0
Merchant bars	1.37c	6 15 0	.66c	3 0 0
Structural shapes	1.50c	7 7 6	.61c	2 15 0
Plates, †¼ in. or 5 mm.	1.67c	8 5 0	.86c	3 18 6
Sheets, black, 24 gage or 0.5 mm.	1.83c	9 0 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	2.23c	11 0 0	1.60c	7 5 0
Bands and strips	1.57c	7 15 0	.83c	3 15 0
Plain wire, base	1.78c	8 15 0	1.18c	5 7 6
Galvanized wire, base	2.13c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.44c	12 0 0	1.27c	5 5 0
Tin plate, box 108 lbs.	$ 3.87	0 17 0	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$14.22	3 2 6(a)	$11.42	210	$11.67	300	$20.95	63
Basic bessemer pig iron	13.42	2 19 0(a)*	10.61	195	9.73	250	23.11	69.50
Furnace coke	3.01	0 13 3	6.53	120	4.28	110	6.40	19.25
Billets	22.75	5 0 0	22.03	405	17.12	440	$32.09	96.50
Standard rails	1.67c	8 5 0	1.75c	700	1.98c	1,100(b)	1.99c	132
Merchant bars	1.40c	6 17 6	1.40c	560	.96c	535	1.66c	110
Structural shapes	1.78c	8 15 0	1.38c	550	.96c	535	1.62c	107.50
Plates, †¼-in. or 5 mm.	1.73c	8 10 0	1.70c	680	1.22c	675	1.92c	127
Sheets, black	2.03c	10 0 0§	2.13c	850‡	1.35c	750‡	2.17c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.54c	12 10 0	3.63c	1,450	2.61c	1,450	5.59c	370
Plain wire	1.78c	8 15 0	2.83c	1,130	2.34c	1,300	2.67c	177
Bands and strips	1.93c	9 10 0	1.55c	620	1.22c	675	1.92c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper

Sheets

Yellow brass (high)	14.75
Copper, hot rolled	17.12½
Lead sheets, cut to jobbers	8.25
Zinc sheets (100-lb. base)	9.00

Tubes and Pipes

Seamless yellow brass (high)	16.37½
Seamless copper	16.62½

Rods

Yellow brass (high, full turnings)	12.25
Naval brass	13.37½

Anodes

Copper, untrimmed	14.50

Wire

Yellow brass (high)	14.75

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass

New York	5.00 to 5.25
Chicago	4.75 to 5.00
Cleveland	5.50 to 5.75
St. Louis	4.50 to 4.75

Heavy Yellow Brass

New York	3.75 to 4.00

Heavy Copper and Wire

New York	6.75 to 7.00
Chicago, No. 1	6.37½ to 6.62½
Cleveland	5.75 to 6.25
St. Louis	5.25 to 5.50

Composition Brass Borings

New York	4.75 to 5.00

Yellow Brass Tubing

Cleveland	4.00 to 4.50

Light Copper

New York	5.50 to 5.75
Chicago	5.12½ to 5.37½
Cleveland	5.25 to 5.50
St. Louis	5.00 to 5.25

Light Brass

Chicago	3.00 to 3.25
Cleveland	3.00 to 3.50
St. Louis	2.75 to 3.00

Lead

New York	3.50 to 3.62½
Cleveland	3.00 to 3.50
Chicago	3.25 to 3.50
St. Louis	3.25 to 3.50

Zinc

New York	2.25 to 2.50
Cleveland	2.25 to 2.75
Chicago	2.50 to 2.75
St. Louis	2.75 to 3.00

Aluminum

Clippings, new, soft, Cleve.	13.00 to 14.50
Clippings, hard, Cleveland	9.00 to 10.00
Borings, Cleveland	5.00 to 6.00
Mixed cast, Cleveland	8.00 to 8.50
Mixed cast, St. Louis	8.00 to 8.50

Secondary Metals

Brass ingot, 85-5-5-5	9.00
Remelt aluminum No. 12	12.50 to 13.50

Metals

Prices, Except for Zinc, Firm To Stronger—Codemaking Has Kept up Uncertainty

New York — Nonferrous metal prices have been firm to stronger this week, zinc excepted. Demand for lead was the most active but fair business also was reported done in tin and zinc. Generally demand for copper was light following the heavy buying done in the metal at the close of last week.

Considerable uncertainty has been evident in the various metal markets the past week. This in part was attributable to the situation surrounding the codification of the various metal industries. At the same time the dull demand in some of the metals has lent an air of disquietude in some parts of the trade with the result that the outlook has been clouded.

Copper — Business in copper has been better than surface appearances indicate. It is estimated that sales the past ten days exceeded 11,000 tons. Foreign demand has been light to fair with the market abroad depressed by reports of larger output. All first hand sellers in the domestic market have held firmly to the 9.00c, Connecticut, level, though some resale metal was available all week at 8.75c.

Lead—Battery makers were the chief buyers of lead this week. Sales in other directions also have been fair with the Midwest market displaying the most activity. The tone of the market has been firm with prices holding unchanged at 4.35c, East St. Louis, and 4.50c, New York.

Tin—Only scattered buying was done in Straits tin this week. Prices, however, advanced due to the stronger Sterling exchange. Tin plate operations continue active and it is believed in the tin market that tin is moving into consumption at a much faster pace than day to day sales indicate. Ninety-nine per cent tin is unavailable for delivery before late September.

Zinc—Some easiness developed in the zinc market this week. This largely was due to weakness abroad though the lack of domestic demand of zinc was a contributing force.

Aluminum—The aluminum market continued inactive with prices easy.

Coke By-Products Steady

New York—Distillates continue firm with little spot business done, supplies being hardly ample to meet contract specifications. Toluol and xylol are especially in short supply. Chemical consumers are taking good quantities of benzol. Sulphate of ammonia is unchanged, both as to demand and price.

Coke By-Products

Per Gallon Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Quicksilver Quiet

New York—Quicksilver prices are practically unchanged, but the tone of the market is not so steady in view of recent light demand. Small lots are $63.50 to $64.50 a virgin flask, while round lots are $63. Some sellers are still quoting a range of $64 to $65 on small lots.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper, Electro., del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York, Spot	Straits Tin, New York, Futures	Lead, N. Y.	Lead, East St. L.	Zinc, St. L.	Aluminum, 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Aug. 19	9.00	9.12½	8.75	44.75	45.00	4.50	4.35	4.90	*22.90	6.87½	35.00
Aug. 21	9.00	9.12½	8.75	44.37½	44.65	4.50	4.35	4.85	*22.90	6.87½	35.00
Aug. 22	9.00	9.12½	8.75	44.10	44.35	4.50	4.35	4.85	*22.90	6.87½	35.00
Aug. 23	9.00	9.12½	8.75	44.62½	44.85	4.50	4.35	4.85	*22.90	6.87½	35.00
Aug. 24	9.00	9.12½	8.75	44.75	44.90	4.50	4.35	4.82½	*22.90	6.87½	35.00
Aug. 25	9.00	9.12½	8.75	46.12½	46.25	4.50	4.35	4.80	*22.90	6.87½	35.00

Revised Iron and Steel Code

(*Concluded from Page 26*)

TIN PLATE, TIN MILL BLACK PLATE AND TERNE PLATE:

Pittsburgh	Pacific Coast Ports
Gary, Ind.	

TUBES—BOILER:

Pittsburgh

TUBE ROUNDS:

Pittsburgh	Chicago
Buffalo	Birmingham
Cleveland	

WHEELS—CAR, ROLLED STEEL:

Pittsburgh	Chicago

WIRE—DRAWN, except as hereinafter specified:

Pittsburgh	Worcester, Mass.
Cleveland	Gulf Ports:
Chicago	New Orleans, La.
Birmingham	Galveston, Tex.
Anderson, Ind.	Houston, Tex.
Duluth, Minn.	Pacific Coast Ports

WIRE NAILS AND STAPLES, BARBED WIRE AND WIRE FENCING:

Pittsburgh	Anderson, Ind.
Cleveland	Duluth, Minn.
Chicago	Gulf Ports
Birmingham	Pacific Coast Ports

WIRE RODS:

Pittsburgh	Chicago
Cleveland	Birmingham

WIRE—SPRING:

Pittsburgh	Worcester, Mass.
Cleveland	Pacific Coast Ports
Chicago	

WIRE—TELEPHONE:

Pittsburgh	Trenton, N. J.
Cleveland	Worcester, Mass.
Waukegan, Ill.	Sparrows Point,
Muncie, Ind.	Md.

Schedule G

Maximum Rates of Discount for Early Payment and Maximum Periods of Free Credit

Maximum Rates of Discount for Early Payment:

In the case of products shipped from plants located east of the Mississippi River to Pacific Coast ports and which shall be invoiced from such plants—½ of 1%, if the invoice of such products shall be paid within 25 days from the date of such invoice; in all other cases—½ of 1%, if the invoice of such products shall be paid within 10 days from the date of such invoice; provided, however, in the latter cases, that any member of the code may allow such discount of ½ of 1% for payment within 10 days on the basis of settlements three times in each month, as follows:

(1) On invoices for products dated from the first to the tenth, inclusive, in any month, such discount may be allowed on payment of such invoices on or before the 20th of such month;

(2) On invoices for products dated from the 11th to the 20th, inclusive, in any month, such discount may be allowed on payment of such invoices on or before the 30th of such month; and

(3) On invoices for products dated from the 21st to the end of any month, such discount may be allowed on payment of such invoices on or before the 10th of the next following month.

Any discount allowed in accordance with the provisions of this Schedule G shall apply only to the invoiced value of the products specified therein and not to any part of the transportation charges of such products.

Maximum Periods of Free Credit:

In the case of products shipped from plants located east of the Mississippi River to Pacific Coast ports and which shall be invoiced from such plants—45 days; in all other cases—30 days.

Schedule H

List of Unfair Practices

For all purposes of the code the following described acts shall constitute unfair practices:

A. Making or promising to any purchaser or prospective purchaser of any product, or to any officer, employe, agent or representative of any such purchaser or prospective purchaser, any bribe, gratuity, gift or other payment or remuneration, directly or indirectly.

B. Procuring, otherwise than with the consent of any member of the Code, any information concerning the business of such member which is properly regarded by it as a trade secret or confidential within its organization, other than information relating to a violation of any provision of the Code.

C. Imitating or simulating any design, style, mark or brand used by any other member of the Code.

D. Using or substituting any material superior in quality to that specified by the purchaser of any product or using or substituting any material or any method of manufacture not in accord with any applicable law, rule or regulation of any governmental authority.

E. Cancelling in whole or in part, or permitting the cancellation in whole or in part of, any contract of sale of any product, except for a fair consideration, or paying or allowing to any purchaser in connection with the sale of any product any rebate, commission, credit, discount, adjustment or similar concession other than as is permitted by the Code and specified in the contract of sale.

F. Disseminating, publishing or circulating any false or misleading information relative to any product or price for any product of any member of the Code, or the credit standing or ability of any member thereof to perform any work or manufacture or produce any product, or to the conditions of employment among the employes of any member thereof.

G. Inducing or attempting to induce by any means any party to a contract with a member of the Code to violate such contract.

H. Aiding or abetting any person, firm, association or corporation in any unfair practice.

I. Making or giving to any purchaser of any product any guaranty or protection in any form against decline in the market price of such product.

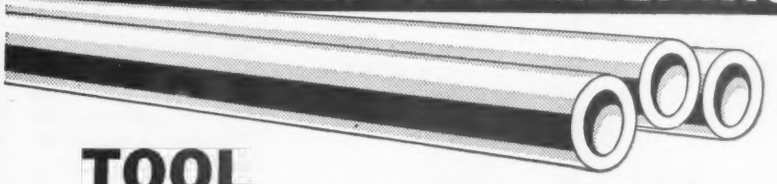
J. Stating in the invoice of any product as the date thereof a date later than the date of the shipment of such product, or including in any invoice any product shipped on a date earlier than the date of such invoice.

K. Making any sale or contract of sale of any product under any description which does not fully describe such product in terms customarily used in the industry.

L. Rendering to any purchaser of any product in or in connection with the sale of such product any service, unless fair compensation for such service shall be paid by such purchaser.

M. Any violation of any other pro-

NONSHRINK OIL HARDENING



TOOL STEEL TUBING

A saving will be realized by using our Tool Steel Tubing. Carried in stock up to 12" O.D. x 2" wall thickness. It is excellent for all classes of dies, slitters, spacers, bushings, etc.

We also supply a special tubing conforming in analysis to S.A.E. 52100 and S.A.E. 4615 designed particularly for Ball Bearing purposes. Can be furnished in Hot Rolled or Cold Drawn finish.

THE BISSETT STEEL CO., Inc.

945 East 67th St., CLEVELAND, OHIO

Cincinnati Pittsburgh Buffalo

vision of the Code, whether or not therein expressed to be such, or using or employing any practice not hereinabove in this Schedule H described which the Board of Directors by the affirmative vote of three-fourths of the whole Board shall have declared to be a practice that would tend to defeat the policy of Title I of the National Industrial Recovery Act and, therefore, an unfair practice, and of which determination by such Board the Secretary shall have given notice to the members of the Code and to the President.

Construction and Enterprise

New York

NEW YORK—Reliable Scrap Iron & Metal Co. has been incorporated with $10,000 capital to prepare and deal in scrap metals, by Rosedale & Cohen, 18 East Forty-first street, New York.

ROCHESTER, N. Y.—Sturgis Mfg. Co. Inc. has been incorporated with $20,000 capital to manufacture tools, implements and metal products, by Blaine F. Sturgis, 420 Lexington avenue, New York.

Ohio

CANTON, O.—Barium Open Hearth Furnace Inc., 250 shares no par value, and Barium Steel Corp., 20,000 shares no par value, have been incorporated by William B. Quinn, 1012 First National Bank building, Canton, O.

CINCINNATI—Globe Wire Fence & Mfg. Co. has been incorporated with 250 shares no par value, by Fred W. Lawrence, 618 First National Bank building, Cincinnati.

CLEVELAND — Union Ornamental Iron & Wire Works Inc. has been incorporated with 200 shares no par value to manufacture wire and iron products, by O. D. Eshelman, 806 Standard Bank building, Cleveland.

CLEVELAND—Automatic Gear Corp. has been incorporated with 1000 shares no par value, by Day & Day, Standard Bank building, Cleveland.

COLUMBIANA, O.—Columbiana Foundry Co. has been incorporated with $25,000 capital by Lewis A. Way, W. V. Wallace and associates.

COLUMBUS, O.—Atlas Brass Foundry Co. has been incorporated with $225,000 capital and 250 shares no par value to operate a castings business, by C. C. Crabbe, Citizens Bank building, Columbus, O.

Illinois

CHICAGO—Leen A Mix Co., 3200 Carroll avenue, has been incorporated with 1000 shares common stock to manufacture and deal in mechanical devices, by Metal Specialties Mfg. Co., 3200 Carroll avenue, Chicago.

CHICAGO—McVittie Plating & Brass Refinishing Works Inc., 1600 South State street, has been incorporated with 150 shares common stock, by James McVittie and associates. Brenner & McBride, 77 West Washington street, are corresondents.

CHICAGO — International Reduction Corp., 105 West Adams street, has been incorporated with 300,000 shares capital stock, to install garbage and sewage reduction plants, by McKinney, Lynde & Crerar, 105 West Adams street.

CHICAGO—Automotive Surplus Materials Corp., 1926 South State street, has been incorporated with 100 shares no par value to manufacture automotive accessories and supplies, by Nathaniel A. Lawrence, 188 West Randolph street, suite 1720.

Southern States

SHREVEPORT, LA.—Trio Refining Co. plans construction of a refinery and oil storage at Overton, Tex., to cost about $28,000.

CHARLOTTE, N. C. — Va-Carolina Chemical Co., G. A. Holderness, Richmond, Va., manager, plans rebuilding large chemical plant destroyed by fire at Charlotte.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids Aug. 29 on specification 576 for one motor-driven vertical spindle surface grinder with hydraulic feed, for delivery at Newport, R. I., and on specification 577 for three universal toolroom cutter grinders for the same delivery.

Arkansas

EL DORADO, ARK.—Lion Oil Co. plans to repair fire damage to its plant and rebuild its stills at cost of about $50,000.

Oklahoma

MIAMI, OKLA.—Cardin Mining & Milling Corp. has been incorporated with $25,000 capital to engage in lead and zinc mining, by Charles A. Neal, president.

VINITA, OKLA.—Empire Steel Mills has bought the old Sinclair Refining Co. plant here and is erecting a shop for the manufacture of culverts and other sheet metal products.

Texas

BEAUMONT, TEX.—Liquometer Co. has been incorporated with $10,000 capital to manufacture metering devices, by E. L. Boykin, care International Derrick & Equipment Co., Beaumont, Tex.

FORT WORTH, TEX.—Southwestern Refining Co. has been incorporated with $8500 capital to operate an oil refinery, by Mark McGee, attorney, First National Bank building.

SAN ANTONIO, TEX.—Black Gold Refining Co. has been incorporated with $10,000 capital to operate an oil refinery, by Carl Nelson, 327 Rosemary street, president.

WICHITA FALLS, TEX.—Ellis Machine & Electric Co. has been established at 1008 Broadway by T. A. Ellis, owner and manager, to specialize in general machine work.

Wisconsin

APPLETON, WIS.—W. S. Patterson Co. has been awarded a contract at $5709 for replacing two boilers and installing a complete air conditioning system in the Jefferson school here.

ATHENS, WIS.—Athens Implement & Mfg. Co., H. B. Esselman, president, will rebuild its burned plant at cost of about $50,000.

KENOSHA, WIS.—Wisconsin Oxygen & Hydrogen Co., 6313 Thirty-first avenue, has let contract to J. C. Tully, Kenosha, for a boiler room addition and equipment, at $28,000.

MILWAUKEE—Printers' Machinery Service Inc. has been incorporated with $5000 capital to carry on a toolmaking and metal working business, by A. McCormack, L. E. Myers and C. C. Miller.

MILWAUKEE—Charles A. Cahill & Sons, 724 East Mason street, have been retained to make a survey of power plant of A. F. Gallun & Sons, tanners, 1918 North Water street, with view to modernizing and substantial enlargement.

WAUSAU, WIS.—Underwood Veneer Co., Wausau, has completed a new saw mill on its timber holdings at Bessemer, Mich., and is preparing to add a planing mill and dry kilns, starting construction at once. O. C. Lemke is president.

Pacific Coast

LOS ANGELES—Mueller Brass Co., Port Huron, Mich., has been given a permit for the construction of a brick foundry building at 2801 East Twelfth street, 150 x 190 feet, to cost $35,000.

COMPTON, CALIF.—City, J. H. Park, city manager, will seek R. F. C. loan for construction of a municipal gas plant and electric light and power plant, to cost about $500,000.

PORTLAND, OREG.—A. C. Forrester and John H. Lewis, engineers, Portland, have asked permission of the city council to build and operate a demonstration sewage disposal plant of 5000 gallons daily capacity, preparatory to submitting a proposal to design and direct construction at the proposed $6,000,000 sewage treatment plant.

SPOKANE — Spokane Brewing & Malting Co. plans construction of a 4-story brick and concrete addition 60 x 70 feet, including engine room, refrigerator plant and increased storage space.

Dominion of Canada

HAMILTON, ONT.—Wentworth Refineries Ltd., Burlington street, will call for bids shortly for steel tanks, refining stills and a pumphouse. B. V. Hole, 159 Bay street, Toronto, is engineer. Cost of improvements is estimated at $30,000.

MONTREAL, QUE.—Canadian Bronze Co. Ltd. is considering plans for an addition to its plant, to cost about $25,000.